144/430(440)MHz FM DUAL BANDER

TH-G71A/E

SERVICE MANUAL

KENWOOD

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B51-8406-00(B) 940

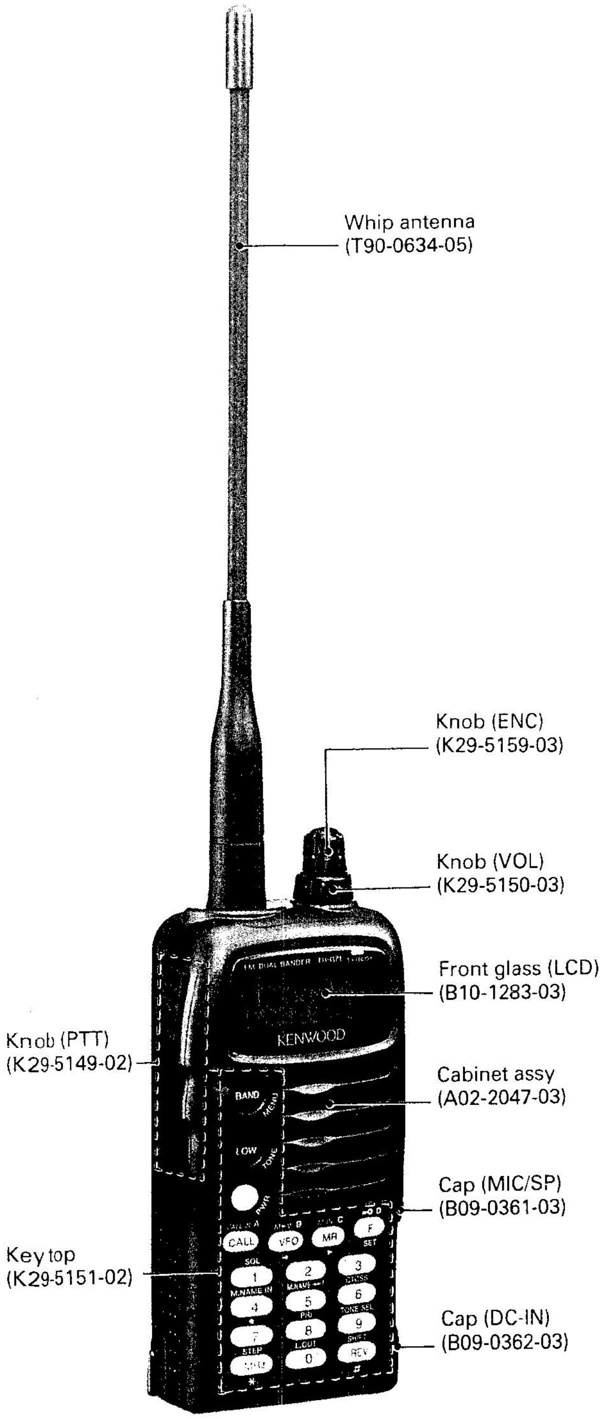
Whip antenna
(T90-0634-05)
Knob (ENC)
(K29-5159-03)
Knob (VOL)
(K29-5150-03)
Front glass (LCD)
(B10-1283-03)
Knob (PTT)
(K29-5149-02)
Cabinet assy
(A02-2047-03)
Cap (MIC/SP)
(B09-0361-03)
Key top
(K29-5151-02)
Cap (DC-IN)
(B09-0362-03)
KENWOOD

Photo is TH-G71A

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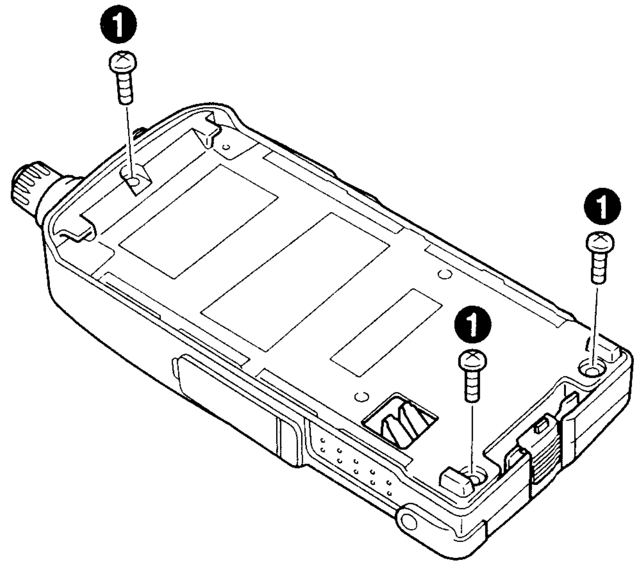
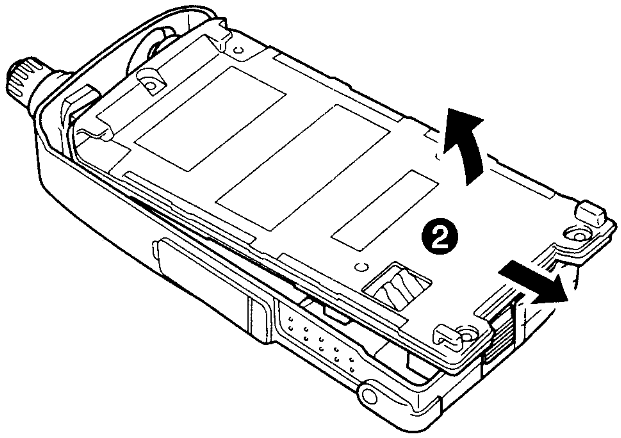
TH-G71A/E

DISASSEMBLY FOR REPAIR

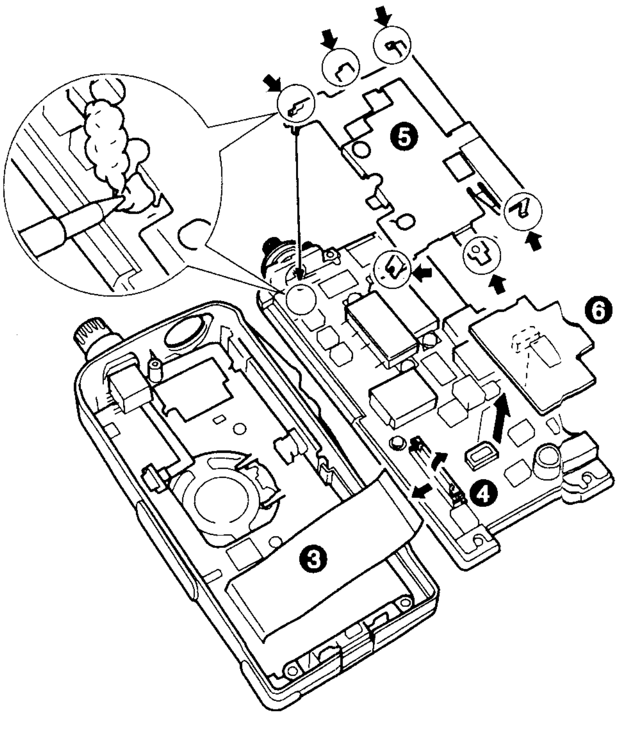
1. Remove the battery pack and whip antenna, then remove the three screws (❶) holding the chassis.



2. Pull the chassis slowly from the antenna side towards the direction shown by the arrow (❷). The antenna connector comes apart and the upper case is separated from the lower case. (However, the flat cable is connected.)



3. The flat cable (❸) can be removed by releasing the connector stopper (❹). The TX-RX unit is attached to the chassis and the switch unit is attached to the front case.
4. The component side of the TX-RX unit is opened by removing the six (❺) soldered points from the shield cover. The daughter board is connected with a connector. Remove the board by lifting it in the direction indicated by the arrow(❻).



Precautions for assembly

- Install the chassis in the case before installing the ANT gasket.
- Check that the PTT installation fixture and the ground spring are inserted all the way in.

CIRCUIT DESCRIPTION

1. Frequency configuration

- The TH-G71A/E has two VCOs for the VHF and UHF bands, but has only one PLL.
  Both VHF and UHF band signals cannot be received at the same time.
- The first local signal for the VHF and UHF bands are generated by the VCO.
- The first local signal for the 800MHz band is produced by doubling the VCO frequency for the UHF band.
- The second local signal is generated by tripling the reference signal frequency.
- The frequency configuration is shown in Figure 1 and Table 1.

Receiving system	Double conversion super heterodyne		
		UHF	VHF
	1st LOCAL (38.85MHz)	Lower	Upper
	2nd LOCAL (450KHz)	Lower	Lower
Transmitting	Direct conversion oscillating amplification		
Modulation	Variable reactance phase		

Table1

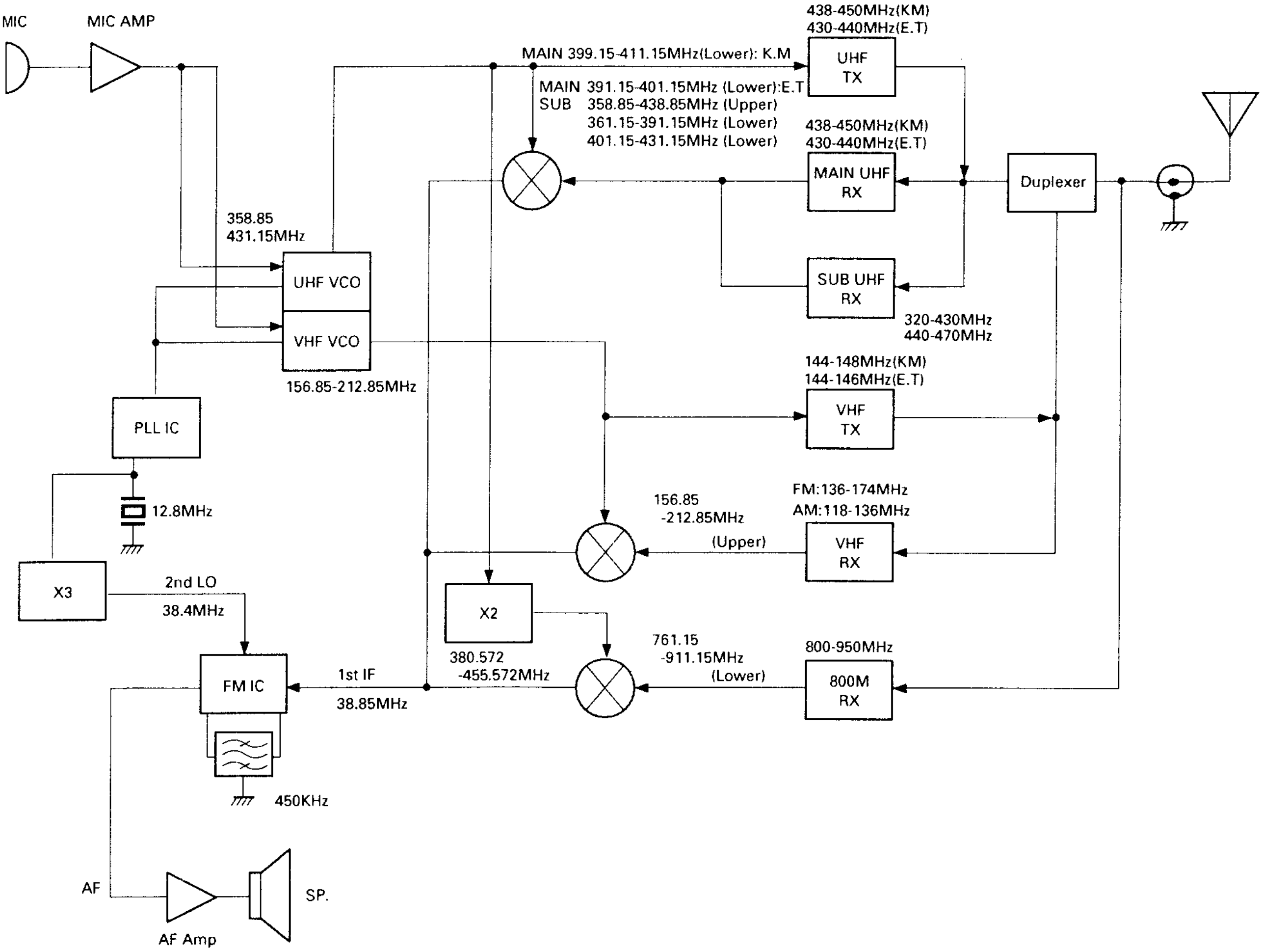

MIC
MIC AMP
MAIN 399.15-411.15MHz(Lower): K.M
MAIN 391.15-401.15MHz (Lower):E.T
SUB 358.85-438.85MHz (Upper)
361.15-391.15MHz (Lower)
401.15-431.15MHz (Lower)
438-450MHz(KM)
430-440MHz(E.T)
UHF TX
438-450MHz(KM)
430-440MHz(E.T)
MAIN UHF RX
Duplexer
SUB UHF RX
320-430MHz
440-470MHz
358.85
431.15MHz
UHF VCO
VHF VCO
156.85-212.85MHz
144-148MHz(KM)
144-146MHz(E.T)
VHF TX
PLL IC
12.8MHz
156.85
-212.85MHz
(Upper)
FM:136-174MHz
AM:118-136MHz
VHF RX
X3
2nd LO
38.4MHz
X2
761.15
-911.15MHz
(Lower)
800-950MHz
800M RX
FM IC
1st IF
38.85MHz
380.572
-455.572MHz
450KHz
AF
AF Amp
SP.

Fig.1 Frequency configuration

TH-G71A/E

CIRCUIT DESCRIPTION

2. Receiver system

■ UHF reception

The first local signal (Lower Hetero •••• Upper Hetero for 300 to 400 MHz reception.) generated by the U-VCO is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ VHF reception

The first local signal (Upper Hetero) generated by the V-VCO is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ 800MHz band reception

The first local signal (Lower Hetero) generated by doubling the U-VCO frequency is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ Audio circuit

- The audio signal (AF) detected by IC4 passes through IC5 (AF switch), and is filtered by Q309. The resulting signal passes through a volume, is amplified by audio amplifier IC312 and output from the internal or external speaker.
- The beep tone and the DTMF signal are output from the microcomputer (IC301).

Receiver system

Item	Rating
Center frequency (fo)	38.85MHz
Pass bandwidth	3dB or less at ± 7.5kHz or more
Attenuation bandwidth	36dB or less at ± 25kHz or less
Guaranteed attenuation	fo ± 1MHz or less at80dB or more
Spurious	fo ± 1MHz or less at40dB or more
Ripple	1.0dB or less
Minimal damage	3.0dB or less
Terminating impedance	550 Ω ± 10% // 2.5pF ± 0.5pF

Table 2: MCF(L71-0481-05):TX-RX UNIT XF1

Item	Rating
Center frequency (fo)	450 ± 1.5kHz
6dB bandwidth	± 7.5kHz or more
40dB bandwidth	± 15.0kHz or less
Guaranteed attenuation	450kHz ± 100kHz or less at 27dB or more
Insertion loss	450kHz or less at 6dB or less
Ripple	± 5.0kHz or less at 1.5dB or less

Table 3: Ceramic filter (L72-0945-05):TX-RX UNITCF1

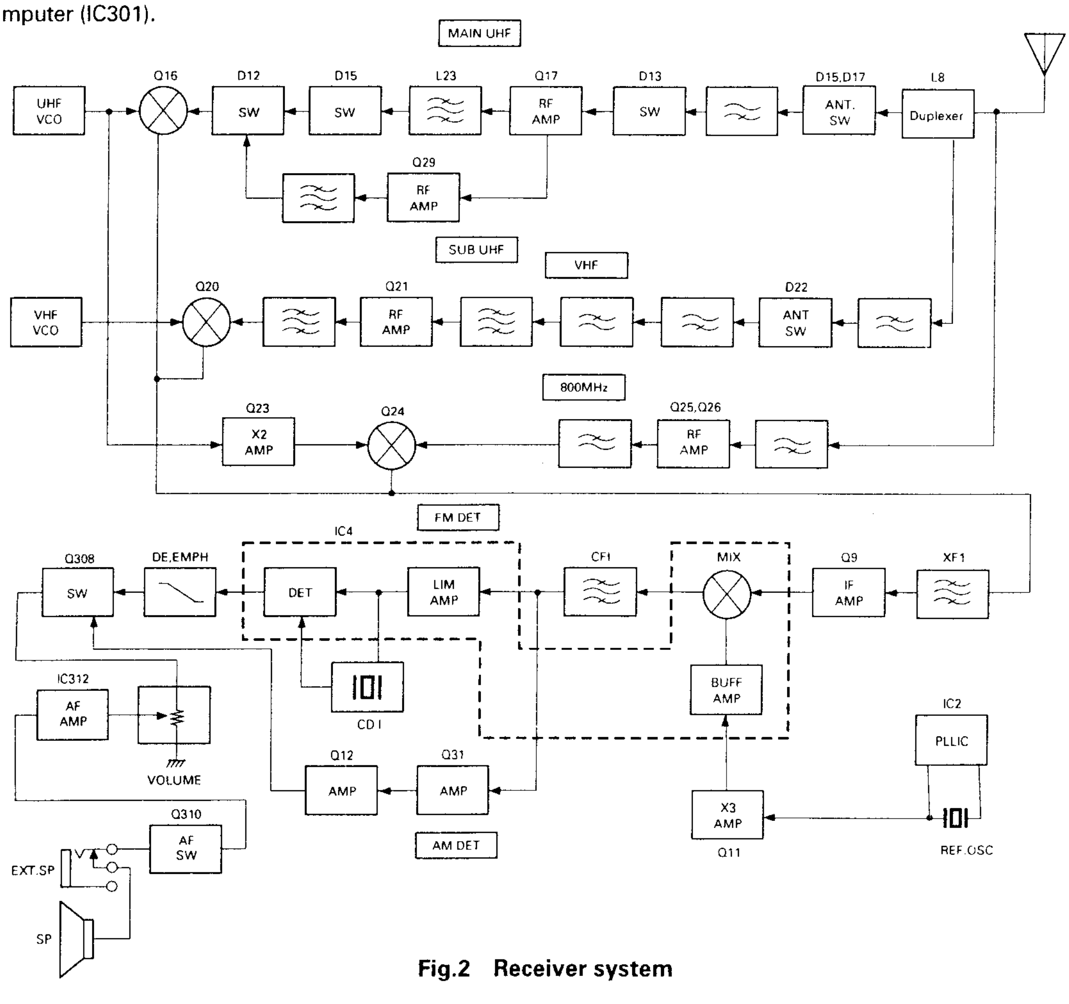

MAIN UHF
UHF VCO
Q16
D12
SW
D15
SW
L23
Q17
RF AMP
D13
SW
D15,D17
ANT. SW
L8
Duplexer
Q29
RF AMP
SUB UHF
VHF
VHF VCO
Q20
Q21
RF AMP
D22
ANT SW
800MHz
Q23
X2 AMP
Q24
Q25,Q26
RF AMP
FM DET
IC4
Q308
SW
DE.EMPH
DET
LIM AMP
CF1
MIX
Q9
IF AMP
XF1
IC312
AF AMP
VOLUME
CD1
BUFF AMP
IC2
PLLIC
Q12
AMP
Q31
AMP
Q310
AF SW
AM DET
X3 AMP
Q11
REF.OSC
EXT.SP
SP

Fig.2 Receiver system

CIRCUIT DESCRIPTION

3. Transmitter system

- The transmitter system is shown in Figure 3.

■ Modulator Circuit

IC313 switches between the internal and external microphones. The audio signal from the microphone is pre-emphasized, limiter-amplified and splatter-filtered by IC311. Frequency shifts are adjusted by VR330 and VR331.

The modulation signal is applied to the varicap for VCO modulation for the VHF and UHF and reactance-modulated.

When the DTMF is used, the input terminal is opened by IC311.

■ Driver and final amplifier

The UHF band VCO output is amplified by three amplifiers, and the VHF band VCO output is amplified by two amplifiers. The resulting signal goes to the power module for each band. The signal then passes through the antenna switch for each band and the chip duplexer (L8) and goes to the antenna.

■ APC circuit

The APC circuit detects the drain current of the power module and controls the transmission output to provide stable transmission output. The voltage at R152, R153, and R154 is amplified by IC302 and Q301, and the difference between the resulting voltage and the reference voltage of each frequency from port 44 of IC301 is detected by IC303 to determine the APC voltage.

The APC voltage is used to control the control pin of the power module.

■ Temperature protection circuit

If the thermistor detects about 80℃, IC301 reduces the APC voltage to prevent thermal breakdown of the power module.

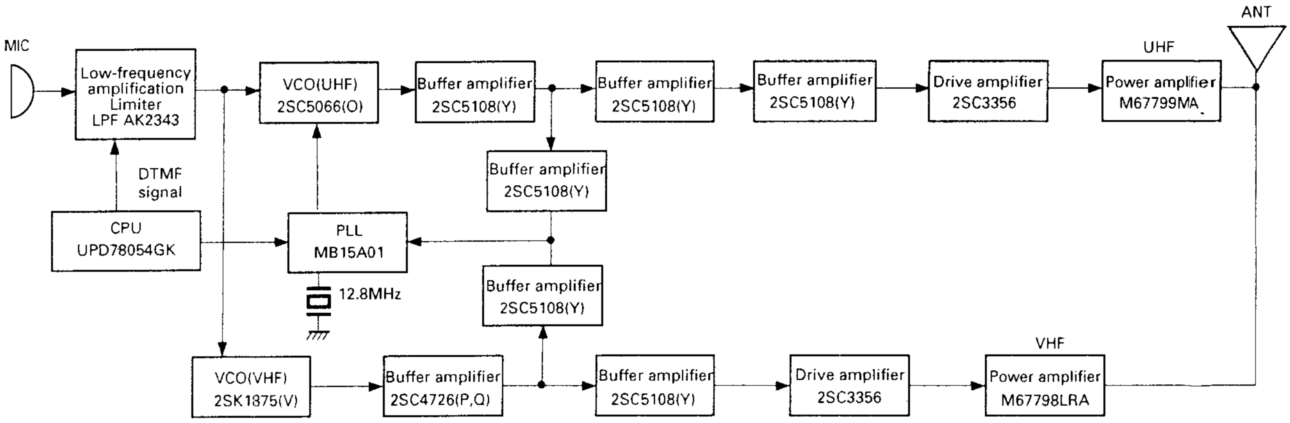

MIC
Low-frequency amplification Limiter LPF AK2343
VCO(UHF) 2SC5066(O)
Buffer amplifier 2SC5108(Y)
Buffer amplifier 2SC5108(Y)
Buffer amplifier 2SC5108(Y)
Drive amplifier 2SC3356
UHF
Power amplifier M67799MA
ANT
DTMF signal
Buffer amplifier 2SC5108(Y)
CPU UPD78054GK
PLL MB15A01
12.8MHz
Buffer amplifier 2SC5108(Y)
VHF
VCO(VHF) 2SK1875(V)
Buffer amplifier 2SC4726(P,Q)
Buffer amplifier 2SC5108(Y)
Drive amplifier 2SC3356
Power amplifier M67798LRA

Fig.3 Transmitter system

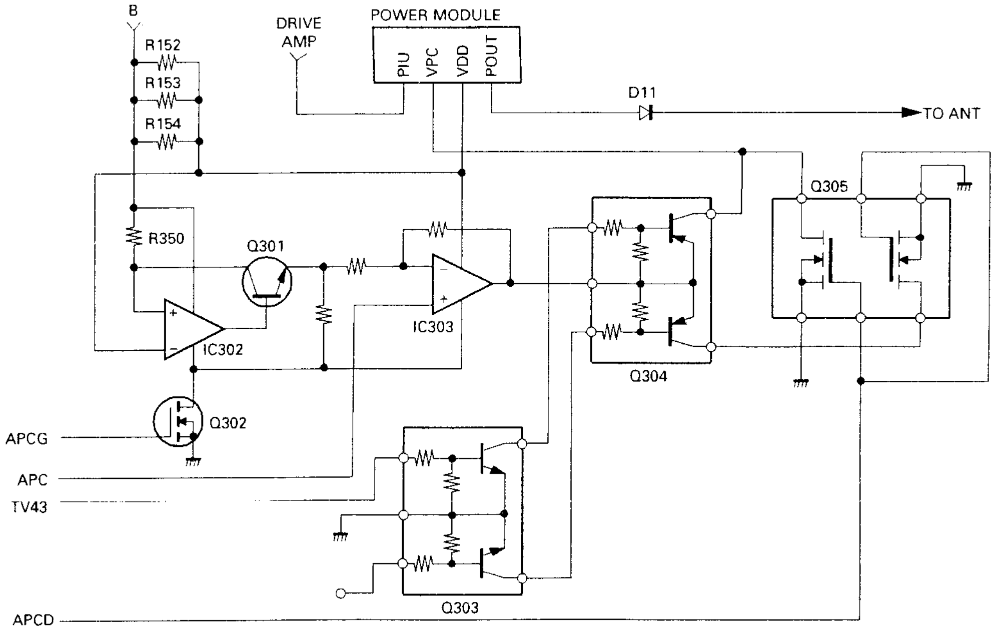

B
R152
R153
R154
R350
DRIVE AMP
POWER MODULE
PIU
VPC
VDD
POUT
D11
TO ANT
Q301
IC303
IC302
Q302
Q304
Q305
APCG
APC
TV43
Q303
APCD

Fig.4 APC circuit (UHF only)

CIRCUIT DESCRIPTION

4. PLL circuit

A single PLL circuit is shared for both the VHF and UHF bands.

The internal oscillator circuit of the PLL IC (IC2) is used as the reference oscillator to supply the oscillation signal to the tripling transistor that produces the PLL reference signal and the second local oscillator signal.

■ Reference oscillator circuit

X1: The 12.8MHz crystal is oscillated by IC2, and the reference signal frequency is divided to produce the 5kHz or 6.25kHz reference frequency.

■ Phase comparison

The comparison frequency is produced by amplifying the VCO output by Q5 (UHF) or Q6 (VHF) and dividing it by the pulse-swallow type PLL IC (IC2). The PLL synthesizer with 5kHz, 6.25kHz, 10kHz, 12.5kHz, 15kHz, 20kHz, 25kHz, 30kHz, 50kHz and 100kHz steps is configured by comparing the phases of the reference frequency obtained by dividing X1.

■ Lock voltage (VCO control voltage)

The pulse output from IC2 pins 15 and 16 according to the phase difference between the reference frequency and comparison frequency passes through the charge pump (Q7, Q8) and ripples are removed by a low-pass filter to produce the lock voltage. The power supply voltage of the charge pump is doubled to about 7 V by the DC/DC converter (IC308).

■ VCO (KCH36)

The KCH36 contains two VCO circuits.

The UHF VCO is a colpitts oscillation circuit consisting of a bipolar transistor Q2 that generates the desired frequency directly. The oscillation frequency is varied by applying the VCO control voltage to the varicap D1 and D2. The SHIFT pin goes low during reception to turn Q1 and D4 OFF and change the oscillation frequency. The audio signal is applied to the varicap D3 and the oscillation frequency is modulated during transmission.

The VHF VCO is a colpitts oscillation circuit consisting of FET: Q102 that generates the desired frequency. The oscillation frequency is varied by applying the VCO control voltage to the varicap D101 and D102. The SHIFT pin goes high during reception to change the oscillation frequency of Q101 and D104. The audio signal is applied to the varicap D103 and the oscillation frequency is modulated during transmission.

■ Unlock detection circuit

When the PLL is unlocked, a low signal is output from the IC2 LD pin. The LD pin voltage is detected by the microcomputer (IC301) to control the transmission/reception switching timing.

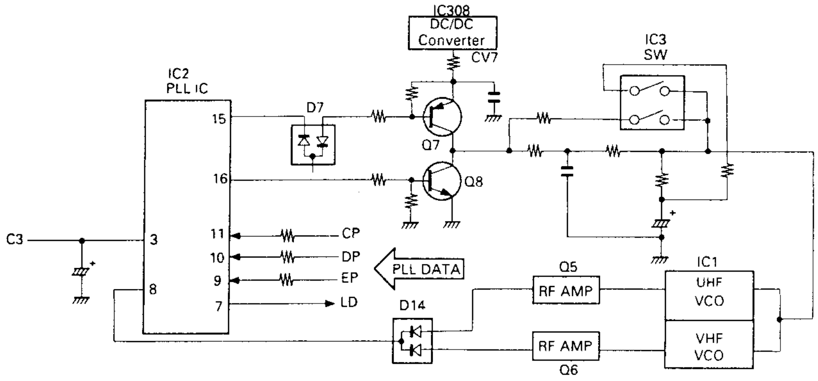

IC308
DC/DC Converter
CV7
IC3
SW
IC2
PLL IC
15
16
D7
Q7
Q8
C3
3
11
10
9
8
7
CP
DP
EP
LD
PLL DATA
D14
Q5
RF AMP
IC1
UHF VCO
VHF VCO
RF AMP
Q6

Fig.5 PLL circuit

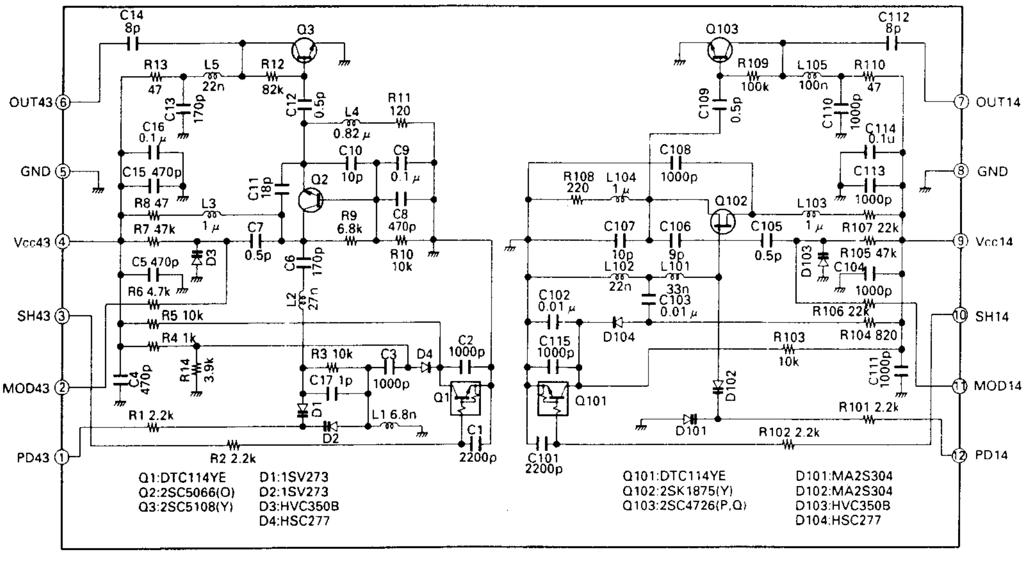

C14 8p
Q3
R13 47
L5 22n
R12 82k
C13 170p
C12 0.5p
L4 0.82μ
R11 120
C16 0.1μ
C10 10p
C9 0.1μ
C15 470p
C11 18p
Q2
R8 47
L3 1μ
R9 6.8k
C8 470p
R7 47k
C7 0.5p
C6 170p
R10 10k
C5 470p
D3
R6 4.7k
L2 27n
R5 10k
R4 1k
R3 10k
C3
D4
C2 1000p
C4 470p
R14 3.9k
C17 1p
1000p
D1
Q1
R1 2.2k
L1 6.8n
D2
C1
R2 2.2k
2200p
OUT43 ⑥
GND ⑤
Vcc43 ④
SH43 ③
MOD43 ②
PD43 ①
Q1:DTC114YE
Q2:2SC5066(O)
Q3:2SC5108(Y)
D1:1SV273
D2:1SV273
D3:HVC350B
D4:HSC277
C112 8p
Q103
R109 100k
L105 100n
R110 47
C109 0.5p
C110 1000p
C114 0.1μ
C108 1000p
C113 1000p
R108 220
L104 1μ
Q102
L103 1μ
R107 22k
C107 10p
C106 9p
C105 0.5p
L102 22n
L101 33n
D103
R105 47k
C104 1000p
C102 0.01μ
C103 0.01μ
R106 22k
C115 1000p
D104
R103 10k
R104 820
D102
C111 1000p
Q101
R101 2.2k
D101
R102 2.2k
C101 2200p
⑦ OUT14
⑧ GND
⑨ Vcc14
⑩ SH14
⑪ MOD14
⑫ PD14
Q101:DTC114YE
Q102:2SK1875(Y)
Q103:2SC4726(P,Q)
D101:MA2S304
D102:MA2S304
D103:HVC350B
D104:HSC277

Fig.6 VCO circuit (KCH36)

CIRCUIT DESCRIPTION

5. Powor supply circuit

■ Ni-Cd battery charging circuit

The constant-current circuit (Q321, D322) supplies about 70 mA to the Ni-Cd battery from the external power supply connected to the DC IN terminal. The constant-current circuit does not work if no external power source is connected to the DC IN terminal.

■ Power switching circuit

The power supply circuit is configured as shown in Figure 7. This circuit provides power to the following components:

B
- RB : Power to the power module
- M3 : Power to the microcomputer, EEPROM, and reset circuit
  - M3S : Power to the LCD, external speaker/microphone, DC/DC converter, microphone changeover switch, and AF AVR reference voltage
- C3 : Baseband IC, BUSY/ON AIR LED, PLL circuit (C3U, C3V), receiver circuit (RV36, RV43, RV80, RV14, AMV, IFV)
- TV : Power to the transmitter circuit (TV14, TV43)

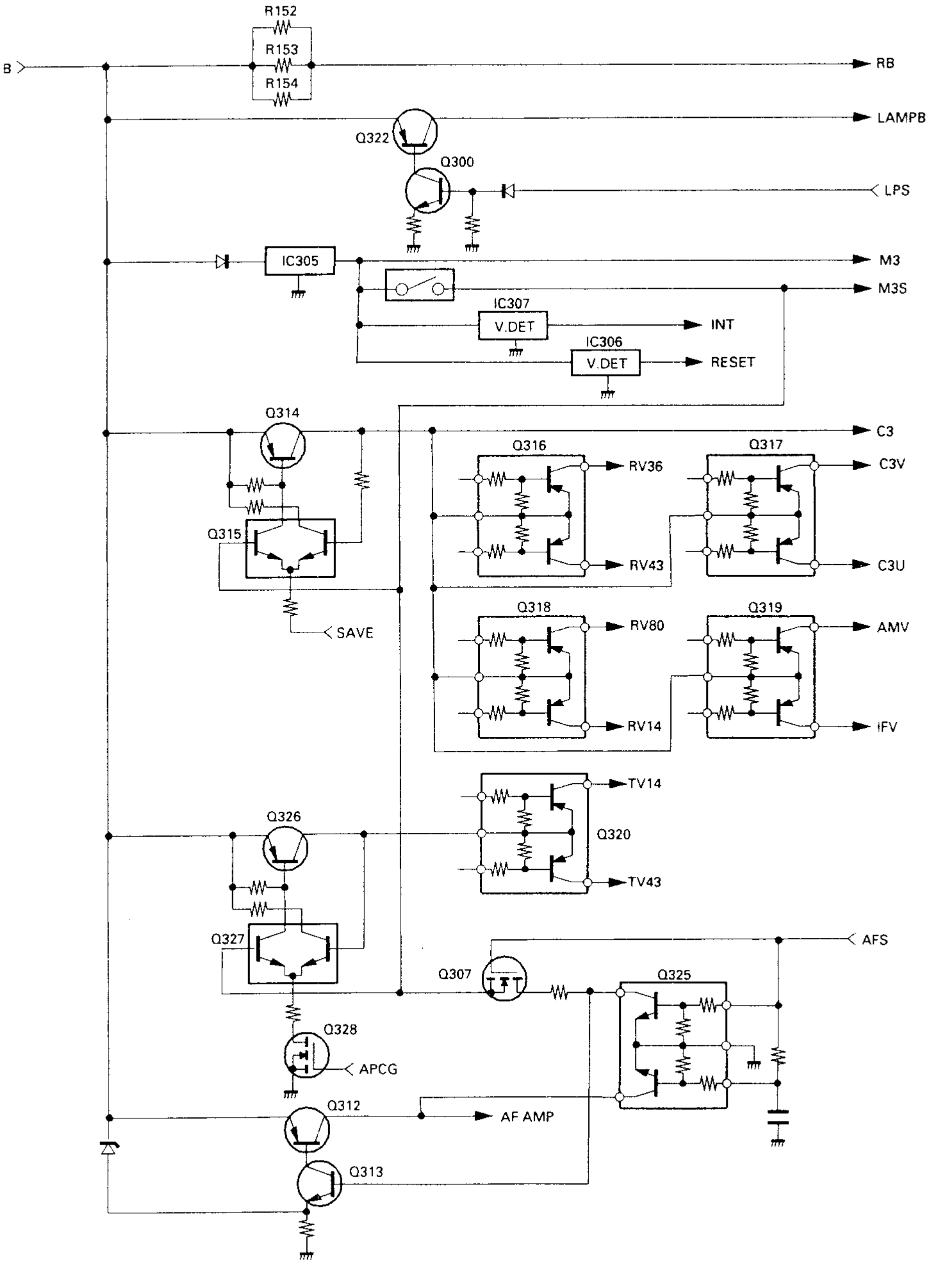

R152
R153
R154
B
RB
LAMPB
Q322
Q300
LPS
IC305
M3
M3S
IC307
V.DET
INT
IC306
V.DET
RESET
Q314
C3
Q316
RV36
Q317
C3V
Q315
RV43
C3U
SAVE
Q318
RV80
Q319
AMV
RV14
IFV
TV14
Q326
Q320
TV43
Q327
AFS
Q307
Q325
Q328
APCG
Q312
AF AMP
Q313

Fig.7 Power supply circuit

6. Microcomputer and peripheral circuits

■ Reset and backup circuits

When power is supplied to the set, the reset circuit makes the VDD and INT ports of the microcomputer (IC301) high due to C353 charging.

The RST port becomes active when the microcomputer starts operation, and goes inactive after the time constant determined by R368 and C357.

If the voltage provided to the set falls and IC305 cannot supply a sufficient voltage to the load, the voltage drop (3.0 V) at the output side of IC305 is detected and the INT port goes low. The microcomputer enters the backup mode, outputs data to IC309 (EEPROM), then enters the stop mode. The EEPROM receives and stores data while C353 is discharging. If the voltage falls below 2.5 V, the voltage detection IC (IC306) detects the voltage drop, and makes the RST port active low.

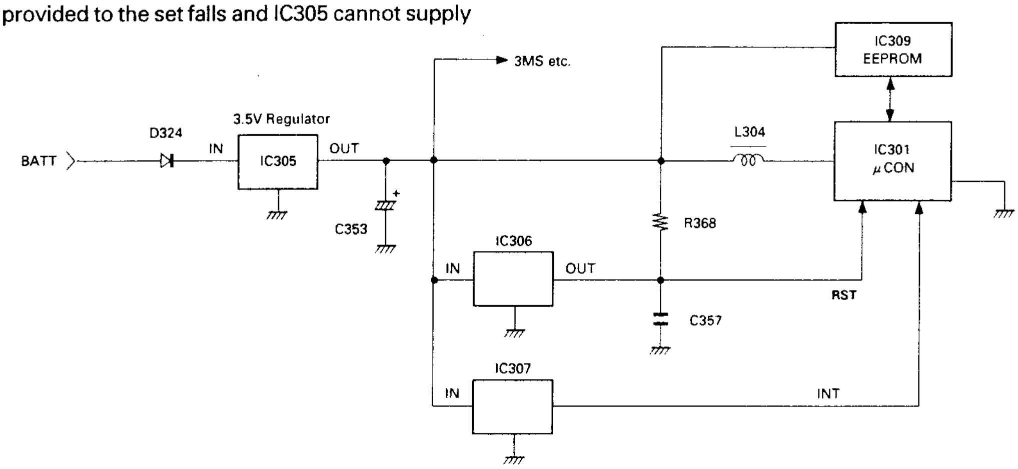

IC309
EEPROM
3MS etc.
3.5V Regulator
D324
BATT
IN
IC305
OUT
L304
IC301
μCON
C353
IC306
IN
OUT
R368
RST
C357
IC307
IN
INT

Fig.8 Reset and backup circuits

■ Battery voltage detection circuit

The power supply voltage is divided by R360 and R361 and applied to the analog port (pin 80) of the microcomputer. If the power supply voltage exceeds 17.5 to 22.0 V, a beep sounds as a warning. The voltage input to the microcomputer during transmission is converted from analog to digital, and it corresponds to the BATT display on the LCD.

■ Battery saver circuit

If squelch is OFF, scan is OFF, save is ON, or a key input state continues for ten seconds, the battery save mode becomes effective.

Q315 is turned ON and OFF for about 150 ms at 1000ms intervals according to the output signal from the SAVE pin of the microcomputer. The power supply for each component is turned ON and OFF to reduce current consumption at standby.

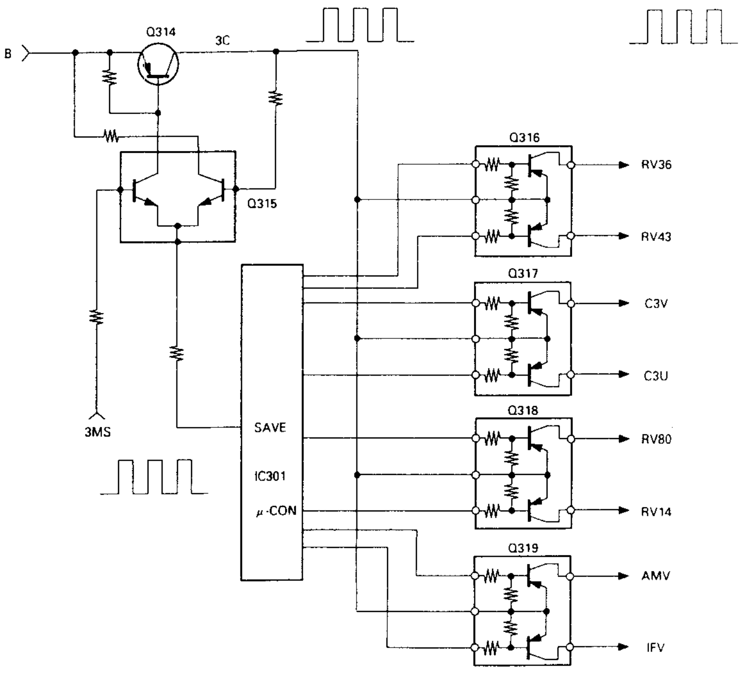

B
Q314
3C
Q315
Q316
RV36
RV43
Q317
C3V
C3U
Q318
RV80
RV14
Q319
AMV
IFV
3MS
SAVE
IC301
μ-CON

Fig.9 Battery saver circuit

CIRCUIT DESCRIPTION

■ LED drive circuit

The LCD and key illumination LED comprise the lamp AVR and are controlled with the LPS port (pin 16) of the microcomputer.

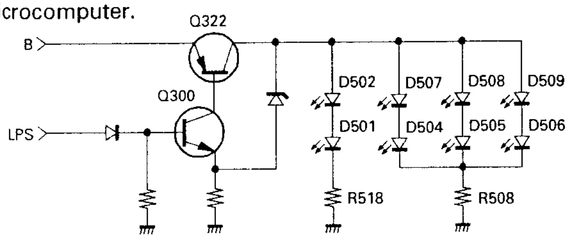

Q322
B
Q300
LPS
D502
D507
D508
D509
D501
D504
D505
D506
R518
R508

Fig.10 LED drive circuit (KEY LED)

The ON AIR/BUSY LED is controlled by the D503 cathodes which are connected to microcomputer ports BYL and TXL.

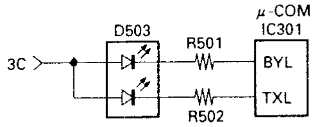

μ-COM
IC301
D503
R501
3C
BYL
TXL
R502

Fig.11 LED drive circuit (ON AIR/BUSY)

■ CTCSS circuit

Tone frequency is set according to the serial data from the microcomputer (IC301). The tone signal passes through the deemphasis circuit and the amplifier (IC311) and goes to the CTCSS circuit.

If the tone matches, IC311 pin 14 goes low. The microcomputer checks the SDO pin and controls the MUTE and AFC pins of IC311.

To transmit a CTCSS signal, the signal output from IC311 pin 18 is synthesized with the audio signal and a modulated signal is output from IC311 pin 4.

■ DTMF

When a DTMF signal is transmitted, it is output from the DTMF port (pin 5) of the microcomputer, and modulated through the microphone amplifier (IC311). The DTMF signal can be monitored from the speaker through the AF amplifier while the signal is being transmitted.

■ Key/encoder input circuit

The signals are input directly to the microcomputer as shown in Figure 12.

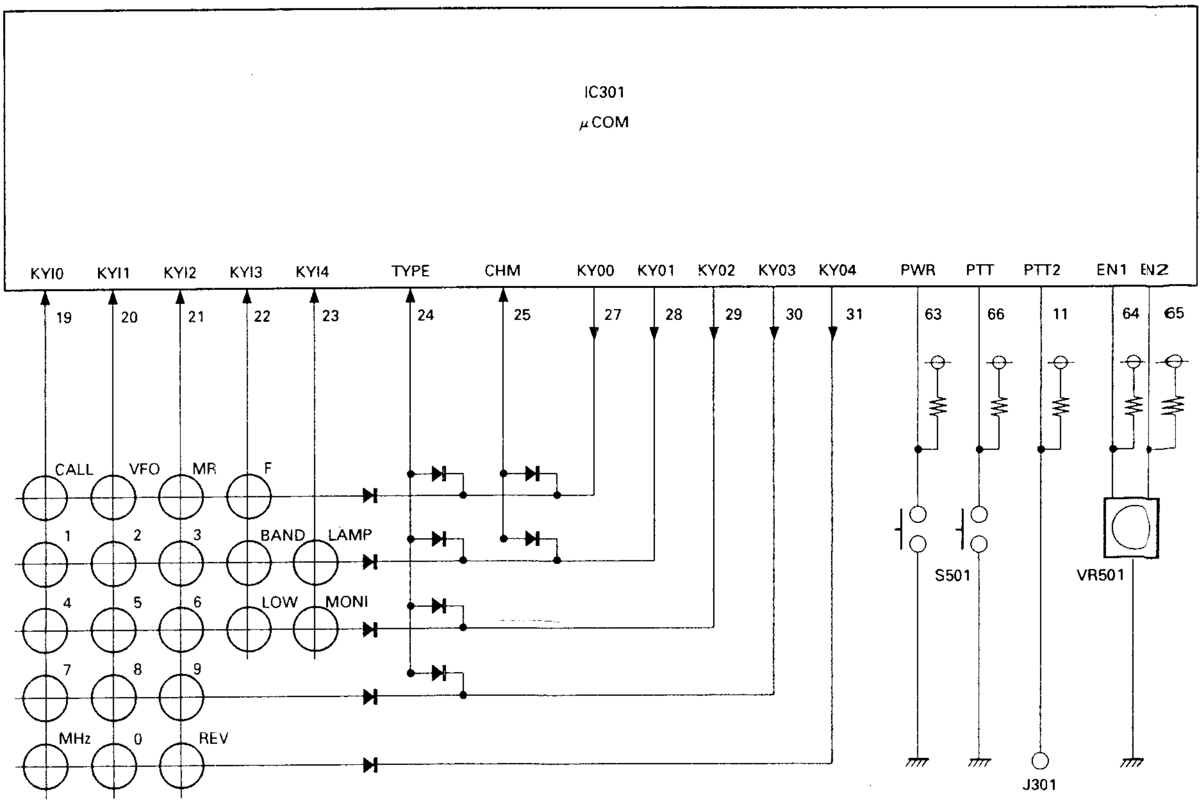

IC301
μCOM
KYI0
KYI1
KYI2
KYI3
KYI4
TYPE
CHM
KY00
KY01
KY02
KY03
KY04
PWR
PTT
PTT2
EN1
EN2
19
20
21
22
23
24
25
27
28
29
30
31
63
66
11
64
65
CALL
VFO
MR
F
1
2
3
BAND
LAMP
4
5
6
LOW
MONI
7
8
9
MHz
0
REV
S501
VR501
J301

Fig.12 Key/encoder input circuit

DESCTIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
IC1	VHF, UHFVCO	HIC
IC2	PLL IC	VHF, UHF common to VHF and UHF
IC3	2-circuit analog switch	Loop filter switching, speed up
IC4	FM IC	
IC5	Multiplexer	AM/FM detector output switching
IC8	Op amp	BPF tuning voltage amp
IC301	Microcomputer	
IC302	Rail input op amp	Detected voltage differential voltage amplifier
IC303	Rail input op amp	Reference voltage and detection voltage comparison, transmission output control voltage
IC305	3.5V regulator	Microcomputer, EEPROM power supply
IC306	2.5V detector	RESET voltage detection
IC307	3.0V detector	INT voltage detection
IC308	Multiplier voltage DC/DC comparator	7V charge pump power supply
IC309	EEPROM	
IC312	Audio amp	
IC313	Multiplexer	M input switching
IC500	LCD driver	
Q1	Ripple filter	VHF VCO
Q2	Ripple filter	UHF VCO
Q3	RF amp	UHF transmission reception common amp
Q4	RF amp	VHF transmission reception common amp
Q5	RF amp	UHF Fin amp
Q6	RF amp	VHF Fin amp
Q7,Q8	Charge pump	
Q9	IF amp	38.85 MHz
Q10	AGCSW	IF amp
Q11	3x amp	2nd local 38.4 MHz
Q12	450 kHz amp	3rd AM amp
Q13	Buffer amp	AGC
Q14	Noise amp	
Q15	Drive amp	UHF 2nd drive
Q16	Mixer	Common to UHF and outside UHF band
Q17	Reception RF amp	UHF
Q19	Drive amp	VHF 1st drive
Q20	Mixer	VHF
Q21	Reception RF amp	VHF
Q22	AGCSW	VHF reception amp
Q23	2x amp	800 MHz 1st local
Q24	Mixer	800 MHz
Q25,Q26	Reception RF amp	800 MHz (cascade connection)
Q27	AGCSW	Reception amp for outside of UHF band
Q28	SW	VHF mixer switch
Q29	Reception RF amp	Reception amp for outside of UHF band
Q30	Switch	VCO shift switch
Q31	Two 450 kHz amps	1st, 2nd AM amps
Q300	Switch	Lamp AVR
Q301	Buffer amp	APC differential amplifier output
Q302	Switch	APC circuit switch
Q303	SW	APC line switch

DESCTIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
Q304	SW	APC line mute switch
Q305	SW	APC line discharge switch
Q306	SW	M3SW
Q308	SW	Reception audio mute switch
Q309	HPF	Reception audio
Q310	SW	Reception audio mute switch
Q312	AVR	Audio amp
Q313	SW	Audio amp AVR
Q314, Q315	AVR	C3
Q316	SW	RV36、RV43
Q317	SW	C3V、C3U
Q318	SW	RV80、RV14
Q319	SW	AMV、IFV
Q320	SW	TV14、TV43
Q321	Constant-current circuit	Battery charge
Q322	AVR	Lamp
Q323	SW	Reception audio mute switch
Q324	SW	Mute switch control line drive
Q325	AVR	Audio amp
Q326, Q327	AVR	Reception power supply (TV)
Q328	SW	Reception power supply (TV)AVRSW
Q329	Drive amp	UHF 1st drive
D1	Speed up	UHF ripple filter
D2	Speed up	VHF ripple filter
D3	RF SW	UHF drive
D4	RF SW	UHF 1st local
D5	RF SW	VHF drive
D6	RF SW	VHF 1st local
D7	Constant-voltage circuit	PLL charge pump
D8	RF SW	800 MHz 1st local
D9	Noise detection	Noise squelch
D10	Constant-voltage circuit	UHF drive
D11	ANT SW	UHF reception
D12	RF SW	UHF reception main, sub mixer input switching
D13	RF SW	UHF reception main, sub RF amp input switching
D14	RF SW	UHF, VHF fin amp output switching
D15	RF SW	UHF reception main, sub isolation
D16, D17	ANT SW	UHF reception
D18, D19	BPF tuning	UHF sub-reception
D20	Constant-voltage circuit	VHF drive
D21	ANT SW	VHF transmission
D22	ANT SW	VHF reception
D23～D25	BPF tuning	VHF reception
D26	ANT SW	VHF transmission
D220	AM detection	
D300	Constant voltage	Charge circuit

DESCTIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
D301	Constant voltage	Lamp AVR
D319	Speed up	Reception audio mute switch
D320	Fixed voltage	Audio amp AVR
D321	Reverse current prevention	DC IN
D322	Constant voltage	Charge circuit
D323	PWM rectification	APC
D324	Reverse current prevention	M3 regulator
D325	Start up	Multiplier voltage circuit
D326	Constant voltage	Lamp AVR
D327	Voltage restriction	Power module protection
D501,D502	LED	LCD illumination
D503	2-color LED	TX/BUSY
D504~D509	LED	Key illumination
D510	Reverse current prevention	Key matrix
D511~D513	Reverse current prevention	Destination
D515,D516	Reverse current prevention	CH display mode
D517	Reverse current prevention	Destination
D518~D521	Reverse current prevention	Key matrix

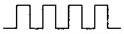
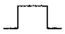
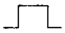
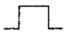
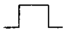
SEMICONDUCTOR DATA

Microcomputer pin functions:UPD78054GK-XXX:IC301

■ **Terminal function**

Pin No.	I/O	Pin name	Active level	SAVE	Function
1	O	AFM1	H	L	Audio line switch H: ON, L: Mute
2	O	AFS	L	H	Audio amplifier power switch L: ON
3	I	SEL	L	I	Data line switching input L: RS-232C mode
4	-	AVSS	-	-	A/D converter circuit Vss pin → Connected to GND.
5	O	DTMF	-	L	DTMF signal D/A output pin
6	O	BPC	-	L	Band-pass tuning D/A output pin
7	-	AVREF1	-	-	D/A converter circuit reference voltage pin
8					
9	O	TxD	-	I/O	RS-232C TxD pin (Connected to REM pin.)
10	O	MICS	-	-	Internal/external microphone switching L: External, H: Internal
11	I	PTT2	L	I	External [PTT] key L: Pressed
12	O	TXL	L	H	Transmit LED (red) switch L: ON
13	O	BYL	L	H	Receive LED (green) switch L: ON
14	I/O	SDA	⎍	I	EEPROM data input/output line
15	O	TR	-	I	VCO shift switch L: VHF TX, H: UHF TX
16	O	LPS	H	L	Lamp switch H: ON
17	O	APCD	L	H	APC voltage discharge control line L: Transmit
18	O	ENP	⎍	L	PLL enable output pin
19	I	KYI0	L	I	Key matrix input port
20	I	KYI1	L	I	Key matrix input port
21	I	KYI2	L	I	Key matrix input port
22	I	KYI3	L	I	Key matrix input port
23	I	KYI4	L	I	Key matrix input port
24	I	TYPE	L	I	Destination input port
25	I	CHM	L	I	Channel display mode input port
26					
27	O	KYO0	L	I	Key matrix output port
28	O	KYO1	L	I	Key matrix output port
29	O	KYO2	L	I	Key matrix output port
30	O	KYO3	L	I	Key matrix output port
31	O	KYO4	L	I	Key matrix output port
32	O	M3SS	H	I	M3S switch (Power to components other than the microcomputer and EEPROM)
33	-	VSS	-	-	Microcomputer ground potential
34	O	ET	⎍	L	AK2343 strobe output pin
35					
36	O	LFS	H	-	High-speed scan loop filter switch H: High speed
37	O	LFVU	-	-	PLL loop filter V/U switching L: VHF, H: UHF
38	O	SAVE	L	H	Save power supply (C3 ON/OFF) L: ON
39	O	APCG	H	L	APC circuit power supply H: ON
40					
41	O	INH	-	H	LCD driver display off input L: OFF, H: ON
42	O	MODE	-	-	LCD driver data type L: Display data, H: Mode data
43	O	CE	⎍	-	LCD driver chip enable H: Enable
44	O	APC	⎍⎍⎍	L	APC PWM output pin

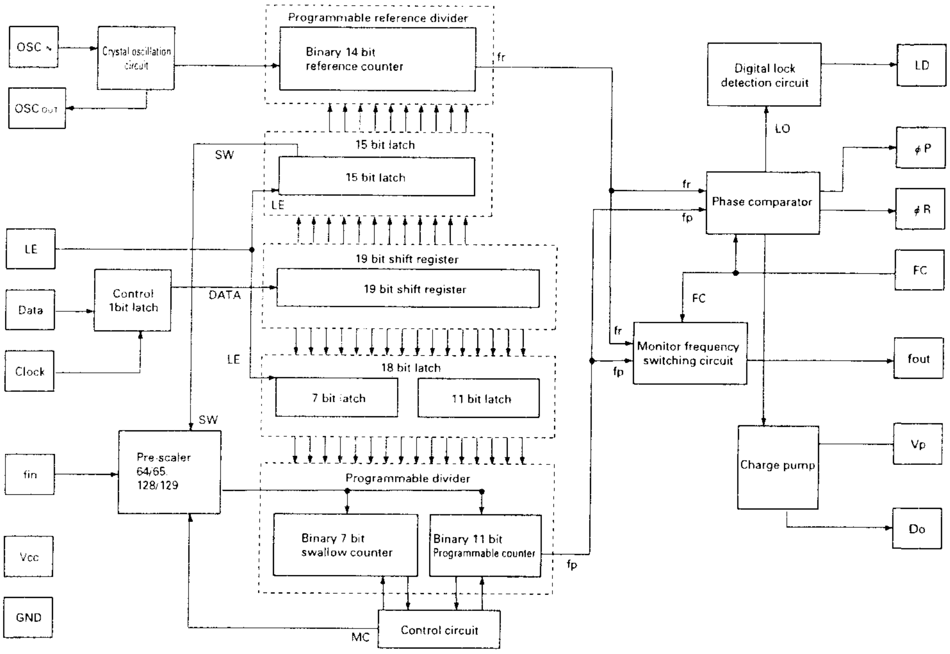
SEMICONDUCTOR DATA

Pin No.	I/O	Pin name	Active level	SAVE	Function
45					
46	O	BEEP		L	BEEP output pin, 1750Hz tone output pin
47	O	DP		L	Common data line
48	O	CP		L	Common clock line
49					
50	O	T14S	L	-	VHF transmitter power supply L:ON
51	O	T43S	L	-	UHF transmitter power supply L:ON
52	O	C3VS	L	-	VHF VCO power supply L:ON
53	O	C3US	L	-	UHF VCO power supply L:ON
54	O	R80S	L	-	800MHz band receiver circuit power supply L:ON
55	O	R14S	L	-	118MHz, 144MHz band receiver circuit power supply L:ON
56	O	AMVS	L	-	AM demodulation switch L:AM, H:FM
57	O	IFVS	L	H	IF power supply L:ON
58	O	R36S	L	-	300MHz band receiver circuit power supply L:ON
59	O	R43S	L	-	430MHz band receiver circuit power supply L:ON
60	I	RESET	L	-	External reset pin L:RESET
61	I	LD	H	I	PLL lock detect input pin H: Lock
62	I	INT	-	I	Power supply detection interrupt input H: Battery
63	I	PWR	L	I	Power switch interrupt input L: Pressed
64	I	EN1		I	Encoder interrupt input
65	I	EN2		I	Encoder data input
66	I	PTT	L	I	Internal [PTT] key L: Pressed
67	O	ISPS	H	-	Internal speaker forced output switch H:ON
68	-	VDD	-	-	Positive power pin
69	-	X2	-	-	System clock (4.19430MHz)
70	I	X1	-	-	System clock (4.19430MHz)
71	-	IC	-	-	Connected to Vss.
72	-	-	-	-	Disabled → Open
73-	I	SDO	L	I	AK2343 tone detection input pin L: Detect
74	-	AVDD	-	-	A/D converter circuit power pin → Connected to V_{DD}.
75	-	AVREF0	-	-	A/D converter circuit reference voltage pin
76	I	SQL	-	I	Squelch noise voltage input
77	I	SM	-	I	S meter voltage input pin
78	I	REM	-	I	Remote control switch detection pin
79	I	THM	-	I	APC temperature detection input pin
80	I	BC	-	I	Power supply voltage detection pin (Battery meter)

SEMICONDUCTOR DATA

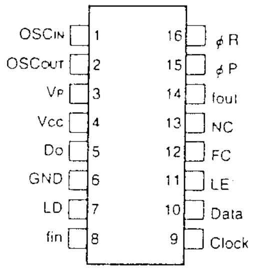
PLL IC:MB15A01:IC2

■ Block diagram


OSC in
OSC out
Crystal oscillation circuit
Programmable reference divider
Binary 14 bit reference counter
fr
15 bit latch
15 bit latch
SW
LE
LE
Data
Clock
Control 1bit latch
DATA
19 bit shift register
19 bit shift register
LE
18 bit latch
7 bit latch
11 bit latch
SW
fin
Pre-scaler 64/65 128/129
Programmable divider
Binary 7 bit swallow counter
Binary 11 bit Programmable counter
fp
Vcc
GND
MC
Control circuit
Digital lock detection circuit
LD
LO
fr
fp
Phase comparator
ϕP
ϕR
FC
FC
fr
fp
Monitor frequency switching circuit
fout
Charge pump
Vp
Do

■ Terminal connection diagram

(TOP VIEW)


OSCIN 1
OSCOUT 2
VP 3
Vcc 4
Do 5
GND 6
LD 7
fin 8
16 ϕR
15 ϕP
14 fout
13 NC
12 FC
11 LE
10 Data
9 Clock

(FPT-16P-M05)

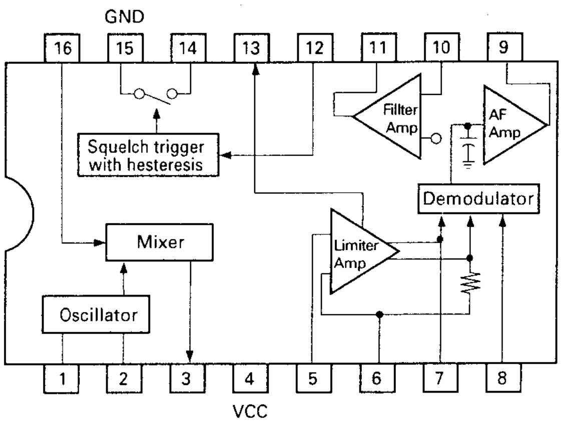
■ Circuit Configuration

Pin No.	Pin name	I/O	Function
1	OSC in	I	Crystal oscillator input and terminal for reference divider input (oscillator input).
2	OSC out	O	Crystal oscillator terminal (crystal oscillator output)
3	V_P	-	Power supply terminal for charger pump output. Connect to Vcc when not using internal charger pump.
4	V_{CC}	-	Power supply terminal
5	D_O	-	Not used
6	GND	-	GND
7	LD	O	Output for lock detection. At lock : LD="H" At unlock : LD="L"
8	fin	I	Prescaler input. Input by AC coupling.
9	Clock	I	Clock input for 19 bit shift register and 16 bit shift register. Data loads at clock pulse rise.
10	Data	I	Serial data input (by binary code). The final data bit is a control bit. At "H" the control bit sends data to 15 bit latch. At "L" sends data to 18 bit latch.
11	LE	I	Load enable signal input (with pull-up resistor). At "LE" = H shift register contents are sent to latch by combining with serial data control bit.
12	FC	-	Not used
13	NC	-	Not used
14	f out	-	Not used
15	ϕ P	O	Output for charge pump with external phase comparator. This is N-ch open drain output.
16	ϕ R	O	Output for charge pump with external phase comparator. This is C-MOS open drain output.

SEMICONDUCTOR DATA

FM IC:MC3372SV:IC4

■ Block diagram


GND
16
15
14
13
12
11
10
9
Squelch trigger with hesteresis
Fillter Amp
AF Amp
Demodulator
Mixer
Limiter Amp
Oscillator
1
2
3
4
5
6
7
8
VCC

■ Terminal function

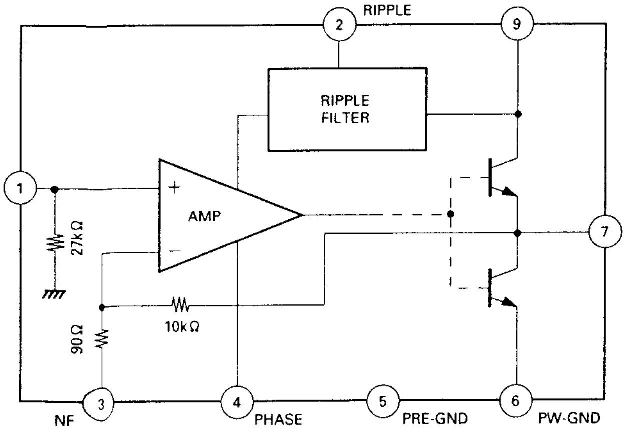
Pin No.	Pin name	Funttion
1	OSC In	Connect the crystal oscillator element to form a Colpitts type oscillator circuit. When using an external oscillator provide the input to terminal No. ① and Vcc to terminal No. ②.
2	OSC Out	
3	MIX Out	Mixer output.
4	Vcc	Power supply.
5	LIM In	This is the limiter amp input as well as ecoupling terminal (output terminal). Terminals No. ⑥ and ⑦ are the AC ground. (Or connect the feedbackresistor and phase comparator capacitor to terminal No. ⑦.)
6	DEC1	
7	DEC2 (LIM Out)	

Pin No.	Pin name	Funttion
8	QUAD In	This is the phase comparator terminal.
9	AF Out	Outputs the detected FM signal.
10	FAmp.In	Inverter terminal for op amp.
11	FAmp.Out	Output terminal for op amp.
12	SQSW In	Input for squelch switch.
13	SMeter Out	Current is output according to limiter amp input signal level.
14	SQSW Out	Squelch circuit output.
15	GND	Ground.
16	MIX In	Mixer input.

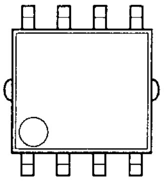
Note:The parts in the parentheses ( ) explain the MC3372.

AF AMP IC:KIA6278F:IC312

■ Block diagram


RIPPLE
2
9
RIPPLE FILTER
1
+
AMP
−
27kΩ
10kΩ
90Ω
7
NF
3
4
PHASE
5
PRE-GND
6
PW-GND

■ Terminal connection diagram



■ Maximum ratings (Ta = 25℃)

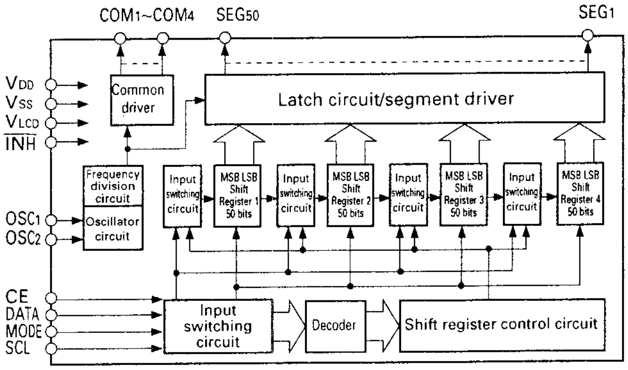
Item	Symbol	Rating	Unit
Power supply voltage	Vcc	14	V
Power loss (comprehensive restrictions) Note 1	PD	900	mW
Operating temperature	Topr	-25~75	℃
Storage temperature	Tstg	-55~150	℃

Note 1. If the temperature exceeds Ta = 25℃, the rated output drops 7.2mW per1℃.

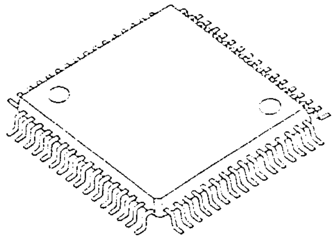
SEMICONDUCTOR DATA

LCD Driver :NJU6433F:IC500

■ **Block diagram**


COM$_1$~COM$_4$
SEG$_{50}$
SEG$_1$
V$_{DD}$
V$_{SS}$
V$_{LCD}$
$\overline{\text{INH}}$
Common driver
Latch circuit/segment driver
Frequency division circuit
Oscillator circuit
OSC$_1$
OSC$_2$
Input switching circuit
MSB LSB Shift Register 1 50 bits
Input switching circuit
MSB LSB Shift Register 2 50 bits
Input switching circuit
MSB LSB Shift Register 3 50 bits
Input switching circuit
MSB LSB Shift Register 4 50 bits
CE
DATA
MODE
SCL
Input switching circuit
Decoder
Shift register control circuit

■ **External view**



■ **Terminal function**

Pin No.	Pin name	Function
1~50	SEG$_1$~SEG$_{50}$	LCD drive segment output.
51	OSC$_1$	CR oscillator element (with external resistor)
52	OSC$_2$	
53	V$_{DD}$	Logic power supply
54	V$_{SS}$	Ground
55	V$_{LCD}$	Liquid crystal power supply.
56	CE	Chip enable signal input. At H level input : LCD display data, Mode set data input mode At pulse fall edge : LCD display data latch At L level input : Disable
57	SCL	Serial data transfer clock input Synchronize the LCD display data with the clock rise and set shift in.
58	DATA	Serial data transfer input. Data capture timing : Clock pulse rise
59	MODE	Mode set input Switches between mode set data and LCD display data. At H level input : Mode set data input. At L level input : LCD display data input.
60	$\overline{\text{INH}}$	Display lamp off input At L level input : Display lamp off At H level input : Display lamp on Display data prior to display lamp off is retained.
61~64	COM$_4$~COM$_1$	LCD drive comon output.

TH-G71A/E

PARTS LIST

* New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L: Scandinavia K: USA P: Canada
Y: PX (Far East, Hawaii) T: England E: Europe
Y: AAFES (Europe) X: Australia M: Other Areas

TH-G71A/E

SWITCH UNIT (X41-342X-XX)

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
TH-G71A/E					
1	1B	*	A02-2047-03	CABINET ASSY	
2	-	*	A02-2078-22	BATTERY CASE ASSY (BT-11) ACSY	M4
3	1A	*	B09-0361-03	CAP (MIC/SP)	
4	1B	*	B09-0362-03	CAP (DC-IN)	
5	1A	*	B10-1283-03	FRONT GLASS (LCD)	
6	3B		B42-3394-14	STANDARD LABEL (FCC)	K,K2
7	3B		B42-5650-04	S/NO. LABEL	
8	-		B46-0310-03	WARRANTY CARD ACSY	T,E,E3
8	-		B46-0469-00	WARRANTY CARD ACSY	K,K2
9	-	*	B59-1308-00	PANFLET ACSY	K,K2
10	-	*	B62-0739-00	INSTRUCTION MANUAL (ENG) ACSY	K,K2,E,T
10	-	*	B62-0739-00	INSTRUCTION MANUAL (ENG) ACSY	M2,M3,M4
10	-	*	B62-0740-00	INSTRUCTION MANUAL (GERM) ACSY	E,E3
10	-	*	B62-0741-00	INSTRUCTION MANUAL (SPE) ACSY	K,K2,E3
10	-	*	B62-0741-00	INSTRUCTION MANUAL (SPE) ACSY	M2,M3,M4
10	-	*	B62-0742-00	INSTRUCTION MANUAL (NTHA) ACSY	E3
10	-	*	B62-0743-00	INSTRUCTION MANUAL (FREN) ACSY	E3
10	-	*	B62-0791-00	INSTRUCTION MANUAL (CHINA) ACSY	M2,M3,M4
10	-	*	B62-0877-00	INSTRUCTION MANUAL (ITA) ACSY	E
11	3A	*	B72-1185-04	MODEL NAME PLATE (FCC)	K,K2
11	3A	*	B72-1186-04	MODEL NAME PLATE	M2,M3,M4
11	3A	*	B72-1187-04	MODEL NAME PLATE	T,E,E3
12	3A	*	E04-0407-05	RF COAXIAL RECEPTACLE (SMA)	
13	-		E19-0254-05	AC CONVERSION PLUG ACSY	M2,M3
14	3B	*	E23-1042-14	TERMINAL (BATTERY)	
15	3A	*	E23-1061-04	GROUND TERMINAL (P MODULE)	
16	2B	*	E37-0681-05	FLAT CABLE	
17	2A	*	F10-2237-13	SHIELDING COVER (RF)	
18	3A	*	F10-2251-04	SHIELDING COVER (VHF)	
19	2B	*	F20-1185-04	INSULATING SHEET (PTT)	
20	2A	*	F20-1186-04	INSULATING SHEET (SHIELD PLATE)	
21	2B	*	G02-0813-14	EARTH SPRING	
22	3A	*	G13-1614-04	CUSHION (BATTERY)	
23	3A	*	G53-0815-02	PACKING (CASE)	
24	1A	*	G53-0818-04	PACKING (SMA)	
25	2A	*	G53-0819-03	PACKING (SP/MIC)	
26	-	*	H12-3011-01	PACKING FIXTURE	
27	-	*	H12-3012-01	PACKING FIXTURE	K,K2,T,E
27	-	*	H12-3012-01	PACKING FIXTURE	E3,M2,M3
28	-		H13-1004-04	CARTON BOARD	K,K2,T
29	-		H25-0085-04	PROTECTION BAG (100/200/0.07)	
30	-	*	H52-1042-02	ITEM CARTON CASE	K,K2
30	-	*	H52-1043-02	ITEM CARTON CASE	T,E,E3
30	-	*	H52-1044-02	ITEM CARTON CASE	M4
30	-	*	H52-1075-02	ITEM CARTON CASE	M2,M3
31	3B	*	J19-1599-03	HOLDER	
32	2B	*	J21-8325-04	HARDWARE FIXTURE (PTT)	
33	-		J29-0631-13	HOOK ACSY	
34	-		J69-0339-05	HANDSTRAP ACSY	
35	2A	*	J82-0043-05	FPC (VOL/ENC)	
36	2B	*	K29-5149-02	KNOB (PTT)	
37	1A	*	K29-5150-03	KNOB (VOL)	
38	1B	*	K29-5151-02	KEY TOP	
39	1A	*	K29-5159-03	KNOB (ENC)	
40	1A		N14-0569-04	CIRCULAR NUT (VOL/ENC)	
A	3A		N30-2605-46	PAN HEAD MACHINE SCREW	
B	2A,2B		N79-2040-46	PAN HEAD TAPTITE SCREW	
C	3B		N80-2010-45	PAN HEAD TAPTITE SCREW	
D	3A	*	N80-2012-46	PAN HEAD TAPTITE SCREW	
E	2B,3A		N83-2005-46	PAN HEAD TAPTITE SCREW	
VR	2A	*	R39-0602-05	VARIABLE RESISTOR (VOL/ENC)	
SP	1A		T07-0341-05	SPEAKER	
ANT	-	*	T90-0634-05	WHIP ANTENNA	
D100	-		ERB83-004	DIODE(BATT CASE:BT-11)	M3
IC100	3A	*	M67798LRA	IC(POWER MODULE:VHF)	
IC101	3A		M67799MA	IC(POWER MODULE:UHF)	
41	-		W08-0437-05	CHARGER (AC 120V) ACSY	K,K2
41	-		W08-0438-15	CHARGER (AC 230V) ACSY	T
41	-		W08-0440-05	CHARGER (AC 230V) ACSY	E,E3
41	-		W08-0441-05	CHARGER (AC 120/230V) ACSY	M2,M3
42	-	*	W09-0909-05	BATTERY ASSY(6V 650mAh) ACSY	K2,T,E2
42	-	*	W09-0909-05	BATTERY ASSY(6V 650mAh) ACSY	E3,M2
42	-	*	W09-0911-05	BATTERY ASSY(9.6V 600mAh) ACSY	K,M3
SWITCH UNIT (X41-342X-XX) 0-11:K,K2 0-21:M2,M3,M4 2-71 :T,E,E3					
101	2A	*	B11-1173-04	REFLECTOR(LCD)	
LCD	2A	*	B38-0780-05	LCD	
D501,502			B30-2143-05	LED (YG)	
D503			B30-2131-05	LED	
D504-509			B30-2157-05	LED (YELLOW)	
C500			CK73GB1H471K	CHIP C 470PF K	
C501			CK73GB1H102K	CHIP C 1000PF K	
C502,503			CK73GB1H103K	CHIP C 0.010UF K	
102	2A	*	E29-1164-04	INTER CONNECTOR (LCD)	
CN501,502		*	E23-1060-04	TERMINAL (SP)	
CN506			E40-5630-05	PIN ASSY SOCKET	
CN507			E40-5629-05	PIN ASSY	
CN508		*	E40-5902-05	FLAT CABLE CONNECTOR (36P)	
CN509		*	E40-5915-05	FLAT CABLE CONNECTOR (6P)	
W500		*	E37-0697-05	PROCESSED LEAD WIRE	
103	2A	*	F10-2239-04	SHIELDING PLATE	
104	2A	*	F20-1191-04	SHIELDING SHEET	
-	-	*	G13-1648-04	CUSHION (LCD)	
105	2A	*	J21-8317-04	HARDWARE FIXTURE (LCD)	
L502,503			L92-0140-05	FERRITE CHIP	
CP501			R90-0724-05	MULTI-COMP 1K X4	
CP502,503			R90-1016-05	MULTIPLE RESISTOR 470Kx4	
CP505			R90-0737-05	MULTIPLE RESISTOR 100Kx2	
CP506			R90-0724-05	MULTI-COMP 1K X4	
R500			RK73FB2A151J	CHIP R 150 J 1/10W	
R501			RK73FB2A471J	CHIP R 470 J 1/10W	
R502			RK73GB1J471J	CHIP R 470 J 1/16W	
R503			RK73GB1J102J	CHIP R 1.0K J 1/16W	

PARTS LIST

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
R504			RK73GB1J471J	CHIP R 470 J 1/16W	
R507			RK73GB1J471J	CHIP R 470 J 1/16W	
R508			RK73FB2A181J	CHIP R 180 J 1/10W	
R509,510			RK73GB1J471J	CHIP R 470 J 1/16W	
R512			RK73GB1J101J	CHIP R 100 J 1/16W	
R513			R92-1252-05	CHIP R 0 OHM	
R514			RK73GB1J154J	CHIP R 150K J 1/16W	
R516,517			RK73GB1J474J	CHIP R 470K J 1/16W	
R518			RK73FB2A151J	CHIP R 150 J 1/10W	
R519			RK73GB1J103J	CHIP R 10K J 1/16W	
R520			R92-1252-05	CHIP R 0 OHM	
S501		*	S70-0460-05	TACT SWITCH	
MIC	2B	*	T91-0580-05	MIC ELEMENT	
D510			MA2S111	DIODE	
D511			MA2S111	DIODE	K,K2
D511			MA2S111	DIODE	M2,M3,M4
D512			MA2S111	DIODE	
D513			MA2S111	DIODE	K,K2
D513			MA2S111	DIODE	T,E,E3
D515-521			MA2S111	DIODE	
IC500		*	NJU6433F	IC(200BIT LCD DRIVER)	
TX-RX UNIT (X57-5410-XX) -11:K,K2 -21:T,E,E3,M2,M3,M4					
C1,2			CK73HB1H471K	CHIP C 470PF K	
C3			C92-0544-05	CHIP-TAN 10UF 4WV	
C4			CK73HB1H102K	CHIP C 1000PF K	
C5			C92-0647-05	CHIP TAN 3.3UF 4WV	
C6			CK73HB1H102K	CHIP C 1000PF K	
C7			CK73HB1C103K	CHIP C 0.010UF K	
C8,9			CK73HB1H471K	CHIP C 470PF K	
C10			CC73HCH1H180J	CHIP C 18PF J	
C11 ,12			CK73HB1H471K	CHIP C 470PF K	
C13			CK73HB1H102K	CHIP C 1000PF K	
C14 ,15			CK73HB1H471K	CHIP C 470PF K	
C16			CK73HB1H102K	CHIP C 1000PF K	
C17			CK73HB1H471K	CHIP C 470PF K	
C18			CC73HCH1H150J	CHIP C 15PF J	
C19			CC73HCH1H220J	CHIP C 22PF J	
C20 ,21			CK73HB1H102K	CHIP C 1000PF K	
C22			CC73HCH1H030C	CHIP C 3.0PF C	
C23			CK73HB1H102K	CHIP C 1000PF K	
C24			CC73HCH1H060D	CHIP C 6.0PF D	
C25			CC73GCH1H010C	CHIP C 1.0PF C	
C26			CC73HCH1H060D	CHIP C 6.0PF D	
C27 ,28			CK73HB1H102K	CHIP C 1000PF K	
C29			CC73HCH1H050C	CHIP C 5.0PF C	
C31			CC73HCH1H050C	CHIP C 5.0PF C	
C32		*	CC73HCH1H120J	CHIP C 12PF J	
C33			CK73HB1H471K	CHIP C 470PF K	
C34			CK73HB1C103K	CHIP C 0.010UF K	
C35			CK73HB1H471K	CHIP C 470PF K	
C36			CK73GB1C104K	CHIP C 0.10UF K	
C37			CK73HB1H471K	CHIP C 470PF K	
C38			CK73GB1C104K	CHIP C 0.10UF K	
C39			C92-0655-05	CHIP-TAN 4.7UF 6.3WV	
C40			C92-0542-05	CHIP-TAN 0.10UF 20WV	
C41 ,42			CK73HB1C103K	CHIP C 0.010UF K	

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
C43			CK73HB1H471K	CHIP C 470PF K	
C44			CC73HCH1H010C	CHIP C 1.0PF C	
C45			CC73HCH1H070D	CHIP C 7PF D	
C46			CC73HCH1H060D	CHIP C 6.0PF D	
C50			CK73GB1H102K	CHIP C 1000PF K	
C51			CC73GCH1H270J	CHIP C 27PF J	
C52			CK73HB1H471K	CHIP C 470PF K	
C53			CK73GB1C104K	CHIP C 0.10UF K	
C55			CC73HCH1H030C	CHIP C 3.0PF C	
C56			CC73HCH1H020C	CHIP C 2.0PF C	
C57			CC73HCH1H030C	CHIP C 3.0PF C	
C70			CC73HCH1H070D	CHIP C 7.0PF D	
C71 ,72			CK73HB1H471K	CHIP C 470PF K	
C73			CC73HCH1H150J	CHIP C 15PF J	K,K2
C73			CK73HB1H471K	CHIP C 470P K	M2,M3,M4,T,E,E3
C74			CC73HCH1H180J	CHIP C 18PF J	
C75			CK73HB1H471K	CHIP C 470PF K	
C76			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C77			CK73HB1H471K	CHIP C 470PF K	
C78			CK73HB1C103K	CHIP C 0.010UF K	
C80			CK73FB1A105K	CHIP C 1.0UF K	
C81			CK73HB1C103K	CHIP C 0.010UF K	
C82			CK73HB1H471K	CHIP C 470PF K	
C83			CK73GB1H471K	CHIP C 470PF K	
C85			CC73GCH1H020C	CHIP C 2.0PF C	
C86			CK73HB1C103K	CHIP C 0.010UF K	
C87			CK73HB1H471K	CHIP C 470PF K	
C88			CC73HCH1H030C	CHIP C 3.0PF C	
C90			CK73HB1H471K	CHIP C 470PF K	
C91			CC73HCH1H070D	CHIP C 7.0PF D	
C92 -94			CK73HB1H471K	CHIP C 470PF K	
C96			CK73HB1H471K	CHIP C 470PF K	
C97			CC73HCH1H390J	CHIP C 39PF J	
C98			CC73HCH1H220J	CHIP C 22PF J	
C99			CC73GCH1H030C	CHIP C 3.0PF C	
C100			CC73GCH1H050C	CHIP C 5.0PF C	
C101			CC73GCH1H010C	CHIP C 1.0PF C	
C102			CK73GB1C104K	CHIP C 0.10UF K	
C103			CK73HB1H471K	CHIP C 470PF K	
C104			CC73HCH1H010C	CHIP C 1.0PF C	
C105			CC73HCH1H070D	CHIP C 7.0PF D	
C106			CK73HB1H471K	CHIP C 470PF K	
C107,108			CC73HCH1H270J	CHIP C 27PF J	
C109			CK73HB1H471K	CHIP C 470PF K	
C110			CC73HCH1H070D	CHIP C 7.0PF D	
C111			CK73HB1H471K	CHIP C 470PF K	
C112			CC73HCH1H070D	CHIP C 7.0PF D	
C113			CC73HCH1H390J	CHIP C 39PF J	
C114			CK73HB1H471K	CHIP C 470PF K	
C116			CC73HCH1H330J	CHIP C 33PF J	
C117			CC73HCH1H060D	CHIP C 6.0PF D	
C118			CC73HCH1H470J	CHIP C 47PF J	
C119		*	CC73HCH1H120J	CHIP C 12PF J	
C120			CC73HCH1H180J	CHIP C 18PF J	
C121			CC73HCH1H330J	CHIP C 33PF J	
C122			CK73HB1H102K	CHIP C 1000PF K	
C123			CC73HCH1H080D	CHIP C 8.0PF D	
C124,125			CK73HB1H102K	CHIP C 1000PF K	
C126			CC73HCH1H330J	CHIP C 33PF J	
C127			CK73HB1H102K	CHIP C 1000PF K	

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PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref.No.	Adrress	New parts	PartsNo.	Description	Destination
C128			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C129			CK73HB1C103K	CHIP C 0.010UF K	
C130			CK73HB1H102K	CHIP C 1000PF K	
C131			CK73FB1A105K	CHIP C 1.0UF K	
C132			CK73HB1C103K	CHIP C 0.010UF K	
C133			CK73HB1H102K	CHIP C 1000PF K	
C134			CC73GCH1H020C	CHIP C 2.0PF C	
C135			CC73GCH1H090D	CHIP C 9.0PF D	
C136			CK73GB1H102K	CHIP C 1000PF K	
C137			CC73GCH1H270J	CHIP C 27PF J	
C138			CC73GCH1H060D	CHIP C 6.0PF D	
C139			CC73GCH1H180J	CHIP C 18PF J	
C140-142			CK73HB1C103K	CHIP C 0.010UF K	
C144			CC73HCH1H060D	CHIP C 6.0PF D	
C145			CK73HB1C103K	CHIP C 0.010UF K	
C147,148			CK73HB1C103K	CHIP C 0.010UF K	
C149			CC73HCH1H220J	CHIP C 22PF J	
C150			CK73GB1C104K	CHIP C 0.10UF K	
C151			CC73HCH1H050C	CHIP C 5.0PF C	
C152			CK73HB1H102K	CHIP C 1000PF K	
C153-155			CK73GB1C104K	CHIP C 0.10UF K	
C156			CK73HB1H102K	CHIP C 1000PF K	
C157			CK73GB1C104K	CHIP C 0.10UF K	
C159			CK73FB1E104K	CHIP C 0.10UF K	
C160			CK73HB1H102K	CHIP C 1000PF K	
C161			CK73GB1C104K	CHIP C 0.10UF K	
C162,163			CK73HB1C103K	CHIP C 0.010UF K	
C165,166			CK73HB1H471K	CHIP C 470PF K	
C167			CC73HCH1H180J	CHIP C 18PF J	
C168			CK73HB1H102K	CHIP C 1000PF K	
C169			CK73GB1C104K	CHIP C 0.10UF K	
C170			CK73GB1C333K	CHIP C 0.033UF K	
C171			CK73FB1E473K	CHIP C 0.047UF K	
C172			CK73GB1C104K	CHIP C 0.10UF K	
C173		*	CK73HB1H471K	CHIP C 470PF K	
C174			CC73HCH1H820J	CHIP C 82PF J	
C175			CK73GB1C104K	CHIP C 0.10UF K	
C176			C92-0623-05	CHIP TAN 22UF 4WV	
C177			CK73GB1C104K	CHIP C 0.10UF K	
C178			CC73HCH1H0R5C	CHIP C 0.5PF C	
C179			CC73HCH1H220J	CHIP C 22PF J	
C180			CK73HB1C103K	CHIP C 0.010UF K	
C181			CC73HCH1H050C	CHIP C 5.0PF C	
C182			CK73HB1H102K	CHIP C 1000PF K	
C184			CC73HCH1H270J	CHIP C 27PF J	
C185			CK73GB1C104K	CHIP C 0.10UF K	
C186,187			CK73HB1H102K	CHIP C 1000PF K	
C188			CK73GB1C104K	CHIP C 0.10UF K	
C189-191			CK73HB1H102K	CHIP C 1000PF K	
C192			CK73GB1C104K	CHIP C 0.10UF K	
C193			CC73HCH1H270J	CHIP C 27PF J	
C194-196			CK73HB1H102K	CHIP C 1000PF K	
C197			CC73HCH1H270J	CHIP C 27PF J	
C199			CC73HCH1H390J	CHIP C 39PF J	
C200			CC73HCH1H330J	CHIP C 33PF J	
C201			CC73HCH1H390J	CHIP C 39PF J	
C202,203			CC73HCH1H060D	CHIP C 6PF D	
C205		*	CC73HCH1H101J	CHIP C 100PF J	
C206			CK73GB1C104K	CHIP C 0.10UF K	
C207		*	CC73HCH1H101J	CHIP C 100PF J	
C208			CK73FB1A105K	CHIP C 1.0UF K	
C209			CK73HB1C103K	CHIP C 0.010UF K	
C210			CK73HB1H471K	CHIP C 470PF K	
C211		*	CC73HCH1H101J	CHIP C 100PF J	
C214			CC73HCH1H040C	CHIP C 4.0PF C	
C215			CK73HB1C103K	CHIP C 0.010UF K	
C216		*	CC73HCH1H1R5C	CHIP C 1.5PF C	
C217			CC73HCH1H020C	CHIP C 2.0PF C	
C218			CC73HCH1H470J	CHIP C 47PF J	
C219		*	CC73HCH1H101J	CHIP C 100PF J	
C220			CC73HCH1H470J	CHIP C 47PF J	
C221			CC73HCH1H030C	CHIP C 3.0PF C	
C222			CK73HB1H471K	CHIP C 470PF K	
C223			CK73HB1C103K	CHIP C 0.010UF K	
C224			CC73HCH1H030C	CHIP C 3.0PF C	
C226			CC73HCH1H0R5C	CHIP C 0.5PF C	
C227			CC73HCH1H220J	CHIP C 22PF J	
C228			CK73GB1C104K	CHIP C 0.10UF K	
C229,230			CK73HB1H471K	CHIP C 470PF K	
C231			CK73HB1H102K	CHIP C 1000PF K	
C232-234		*	CC73HCH1H101J	CHIP C 100PF J	M2,M3,M4,T,E,E3
C235			CC73GCH1H060D	CHIP C 6P D	M2,M3,M4,T,E,E3
C236			CC73GCH1H070D	CHIP C 7P D	M2,M3,M4,T,E,E3
C300		*	CK73EF1A106Z	CHIP C 10UF 10WV	
C301-303			CK73HB1H102K	CHIP C 1000PF K	
C304			CK73GB1H392K	CHIP C 3900PF K	
C305			CK73HB1C103K	CHIP C 0.010UF K	
C306			CK73GB1H471K	CHIP C 470PF K	
C307,308			CK73HB1H471K	CHIP C 470PF K	
C309			CK73GB1E223K	CHIP C 0.022UF K	
C310			CK73HB1H102K	CHIP C 1000PF K	
C311			CK73FB1H102K	CHIP C 1000PF K	
C312			C92-0587-05	CHIP-TAN 2.2UF 4WV	
C313,314			CK73GB1C104K	CHIP C 0.10UF K	
C315,316			CK73GB1C223K	CHIP C 0.022UF K	
C317			CK73GB1C104K	CHIP C 0.10UF K	
C318			C92-0633-05	CHIP-TAN 22UF 10WV	
C319			CK73GB1C104K	CHIP C 0.10UF K	
C320-322			CK73GB1C473K	CHIP C 0.047UF K	
C323			C92-0628-05	CHIP-TAN 10UF 10WV	
C324		*	CK73EF1A106Z	CHIP C 10UF Z	
C325			CK73HB1H471K	CHIP C 470PF K	
C326			CK73FB1A105K	CHIP C 1.0UF K	
C327			CK73HB1H471K	CHIP C 470PF K	
C328			C92-0647-05	CHIP-TAN 3.3UF 4WV	
C329			CK73HB1H102K	CHIP C 1000PF K	
C330			CK73HB1H471K	CHIP C 470PF K	
C331			CK73GB1H471K	CHIP C 470PF K	
C332,333			C92-0605-05	CHIP-TAN 150UF 6.3WV	
C334			CK73GB1C473K	CHIP C 0.047UF K	
C335		*	CC73HCH1H101J	CHIP C 100PF J	
C336,337			CK73GB1C104K	CHIP C 0.10UF K	
C338			C92-0594-05	CHIP TAN 4.7UF 4WV	
C339			CK73HB1H102K	CHIP C 1000PF K	
C340,341			CK73HB1H471K	CHIP C 470PF K	
C342			CK73HB1C103K	CHIP C 0.010UF K	
C343			CK73GB1C104K	CHIP C 0.10UF K	
C344			CK73HB1H102K	CHIP C 1000PF K	
C345			CK73GB1H471K	CHIP C 470PF K	
C346-352			CK73HB1H471K	CHIP C 470PF K	

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
C353			C90-4017-05	ELECTRO 470UF 4WV	
C354-356			CK73HB1H471K	CHIP C 470PF K	
C357			CK73GB1C104K	CHIP C 0.10UF K	
C358,359			CK73HB1H471K	CHIP C 470PF K	
C360-362			C92-0651-05	CHIP-TAN 6.8UF 10WV	
C363,364			CK73HB1H471K	CHIP C 470PF K	
C365		•	CC73HCH1H101J	CHIP C 100PF J	
C366			CK73HB1C103K	CHIP C 0.010UF K	
C367,368			CK73HB1H471K	CHIP C 470PF K	
C369			CK73HB1H102K	CHIP C 1000PF K	
C370			CK73GB1C104K	CHIP C 0.10UF K	
C371-373			CK73HB1H471K	CHIP C 470PF K	
C374-377			CK73HB1H102K	CHIP C 1000PF K	
C378,379			CK73HB1H471K	CHIP C 470PF K	
C380			CK73GB1H103K	CHIP C 0.010UF K	
C381			CK73GB1H102K	CHIP C 1000P K	
C382			CK73GB1C103K	CHIP C 0.010UF K	
C383,384			CK73HB1H102K	CHIP C 1000PF K	
C385,386			CK73HB1C103K	CHIP C 0.010UF K	
C388			CK73GB1C104K	CHIP C 0.10UF K	
C389			CK73HB1H471K	CHIP C 470PF K	
C390			CC73HCH1H150J	CHIP C 15PF J	
C391			CK73HB1H471K	CHIP C 470PF K	
C392			CK73HB1H182K	CHIP C 1800PF K	
C393			CK73FB1A105K	CHIP C 1.0UF K	
C394			CK73GB1C104K	CHIP C 0.10UF K	
C395			CK73HB1H471K	CHIP C 470PF K	
C396			CK73FB1A105K	CHIP C 1.0UF K	
C398			C92-0647-05	CHIP-TAN 3.3UF 4WV	
C399			C92-0587-05	CHIP-TAN 2.2UF 4WV	
C400,401			CK73FB1A105K	CHIP C 1.0UF K	
C402			CK73HB1H471K	CHIP C 470PF K	
C403-405			CK73HB1H102K	CHIP C 1000PF K	
C406,407		•	CC73HCH1H101J	CHIP C 100PF J	
C408			CK73HB1H102K	CHIP C 1000PF J	
C410,411			CK73HB1H471K	CHIP C 470PF K	
C412			CK73GB1C104K	CHIP C 0.10UF K	
C413			CK73FB1A105K	CHIP C 1.0UF K	
C414			C92-0594-05	CHIP TAN 4.7UF 4WV	
C415,416			CK73HB1H471K	CHIP C 470PF K	
C417			CK73GB1C104K	CHIP C 0.10UF K	
C419			CK73HB1H471K	CHIP C 470PF K	
C433-437			CK73HB1H471K	CHIP C 470PF K	
C438			CK73GB1C104K	CHIP C 0.10UF K	
C439			CK73FB1A105K	CHIP C 1.0UF K	
C440			CK73GB1C104K	CHIP C 0.10UF K	
C441,442			CK73HB1H471K	CHIP C 470PF K	
C443			C92-0647-05	CHIP-TAN 3.3UF 4WV	
C444-448			CK73HB1H471K	CHIP C 470PF K	
C449			CC73HCH1H050C	CHIP C 5.0PF C	K,K2
C450			CC73HCH1H060D	CHIP C 6.0PF D	
C451			CK73HB1H471K	CHIP C 470PF K	
C452			C92-0651-05	CHIP-TAN 6.8UF 10WV	
C453			CK73HB1H102K	CHIP C 1000PF K	
C454			CC73HCH1H270J	CHIP C 27PF J	
C456			CC73HCH1H100D	CHIP C 10PF D	
C457,458			CK73GB1H103K	CHIP C 0.010UF K	
TC1			C05-0384-05	CERAMIC TRIMMER CAP(10P)	

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
CN1	2A	•	E23-1059-04	TERMINAL	
CN301		•	E40-5902-05	FLAT CABLE CONNECTOR(LCD)	
CN302		•	E40-5907-05	PIN ASSY SOCKET(20P)	
CN303		•	E40-5906-05	PIN ASSY (20P)	
J301			E11-0467-05	3.5D PHONE JACK(5P)	
J302			E11-0439-05	2.5D PHONE JACK(5P)	
J303			E03-0170-05	DC JACK	
201	2B	•	F20-1181-04	INSULATING SHEET(VCO)	
F1			F53-0128-05	FUSE(0.5A 50V)	
202	2B	•	G13-1630-14	CUSHION (10/10/1.5 CONT)	
CD1		•	L79-1474-05	TUNING COIL (450KHZ)	
CF1		•	L72-0945-05	CERAMIC FILTER(450KHZ)	
L1			L92-0140-05	FERRITE CHIP	
L2			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L3		•	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
L4			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L6			L92-0140-05	FERRITE CHIP	
L7			L34-1264-05	AIR-CORE COIL(2.5T)	
L8			L79-1101-15	FILTER MODULE	
L9			L92-0140-05	FERRITE CHIP	
L11 ,12			L40-5668-53	SMALL FIXED INDUCTOR(5.6NH)	
L14		•	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
L16			L92-0140-05	FERRITE CHIP	
L17		•	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L18			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L19 ,20		•	L34-4515-05	AIR-CORE COIL	
L21			L40-1275-54	SMALL FIXED INDUCTOR(12NH)	
L22		•	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L23		•	L79-1492-05	FILTER MODULE (435MHz)	T,E,E3
L23		•	L79-1492-05	FILTER MODULE (435MHz)	M2,M3,M4
L23		•	L79-1493-05	FILTER MODULE(445MHz)	K,K2
L24		•	L40-1575-36	SMALL FIXED INDUCTOR(15NH)	
L25 ,26			L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
L28 ,29		•	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L30 ,31			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L32			L40-6875-54	SMALL FIXED INDUCTOR(68NH)	
L33		•	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
L35			L92-0140-05	FERRITE CHIP	
L36			L33-1290-05	SMALL FIXED INDUCTOR	
L37 ,38			L34-1333-05	AIR-CORE COIL(8.5T)	
L39 ,40		•	L34-4506-05	COIL	
L41		•	L34-4507-05	COIL	
L42			L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
L44		•	L40-1075-36	SMALL FIXED INDUCTOR(10NH)	
L45		•	L40-8265-69	SMALL FIXED INDUCTOR(8.2NH)	
L46			L33-1301-05	SMALL FIXED INDUCTOR(4.7NH)	
L47		•	L40-5668-52	SMALL FIXED INDUCTOR(5.6NH)	
L48			L40-5681-37	SMALL FIXED INDUCTOR(0.560μH)	
L50			L40-5681-37	SMALL FIXED INDUCTOR(0.560μH)	
L51			L92-0140-05	FERRITE CHIP	
L52			L33-1290-05	SMALL FIXED INDUCTOR	
L53			L40-2775-54	SMALL FIXED INDUCTOR(27NH)	
L54		•	L40-1575-36	SMALL FIXED INDUCTOR(15NH)	
L55		•	L40-1095-68	SMALL FIXED INDUCTOR(1UH)	
L56		•	L40-1078-53	SMALL FIXED INDUCTOR(10NH)	
L57		•	L40-2775-36	SMALL FIXED INDUCTOR(27NH)	
L58			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L60 ,61			L40-6875-54	SMALL FIXED INDUCTOR(68NH)	

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PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref.No.	Adrress	New parts	PartsNo.	Description	Destination
L62		*	L40-1281-36	SMALL FIXED INDUCTOR(0.12UH)	
L63			L40-5681-37	SMALL FIXED INDUCTOR(0.560UH)	
L64			L33-1290-05	SMALL FIXED INDUCTOR	
L65			L40-3975-54	SMALL FIXED INDUCTOR(39NH)	
L66		*	L40-3375-54	SMALL FIXED INDUCTOR(33NH)	
L301			L92-0140-05	FERRITE CHIP	
L303			L92-0140-05	FERRITE CHIP	
L304			L33-0737-05	SMALL FIXED INDUCTOR	
L305			L92-0137-05	FERRITE CHIP	
L306			L40-1875-36	SMALL FIXED INDUCTOR(18NH)	
L307			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
L308,309			L40-1875-36	SMALL FIXED INDUCTOR(18NH)	
L310			L40-5681-37	SMALL FIXED INDUCTOR(0.56UH)	
L311			L40-1875-36	SMALL FIXED INDUCTOR(18NH)	
L312			L92-0140-05	FERRITE CHIP	
X1			L77-1663-05	CRYSTAL RESONATOR(12.8MHZ)	
X301			L78-0367-05	RESONATOR (4.19MHZ)	
XF1			L71-0481-05	MCF (38SC15B)	
CP1		*	R90-0745-05	MULTIPLE RESISTOR 470Kx2	
CP2 -9			R90-0741-05	MULTIPLE RESISTOR 1K x2	
R3,4			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R5			RK73HB1J563J	CHIP R 56K J 1/16W	
R6			RK73HB1J221J	CHIP R 220 J 1/16W	
R7			RK73HB1J220J	CHIP R 22 J 1/16W	
R9			RK73HB1J470J	CHIP R 47 J 1/16W	
R10 ,11			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R12			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R13			RK73HB1J184J	CHIP R 180K J 1/16W	
R14			RK73HB1J220J	CHIP R 22 J 1/16W	
R15			RK73HB1J224J	CHIP R 220K J 1/16W	
R16			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R17			RK73HB1J220J	CHIP R 22 J 1/16W	
R18 -20			RK73HB1J103J	CHIP R 10K J 1/16W	
R21			RK73HB1J154J	CHIP R 150K J 1/16W	
R22			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R23			RK73HB1J470J	CHIP R 47 J 1/16W	
R24			RK73HB1J154J	CHIP R 150K J 1/16W	
R25			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R26			RK73HB1J470J	CHIP R 47 J 1/16W	
R27 ,28			RK73HB1J104J	CHIP R 100K J 1/16W	
R29			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R30			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R31			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R32			RK73HB1J223J	CHIP R 22K J 1/16W	
R33			RK73HB1J103J	CHIP R 10K J 1/16W	
R34			RK73HB1J273J	CHIP R 27K J 1/16W	
R35			RK73HB1J103J	CHIP R 10K J 1/16W	
R36			RK73HB1J101J	CHIP R 100 J 1/16W	
R37 ,38			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R39			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R40			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R41			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R42			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R43 -45			RK73HB1J392J	CHIP R 3.9K J 1/16W	
R46			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R49			RK73HB1J561J	CHIP R 560 J 1/16W	
R50			RK73HB1J151J	CHIP R 150 J 1/16W	
R51			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R52			RK73HB1J220J	CHIP R 22 J 1/16W	

Ref.No.	Adrress	New parts	PartsNo.	Description	Destination
R53			RK73HB1J561J	CHIP R 560 J 1/16W	
R54			RK73HB1J180J	CHIP R 18 J 1/16W	
R55			RK73HB1J101J	CHIP R 100 J 1/16W	
R56			R92-1368-05	CHIP R 0 OHM	
R57			RK73HB1J680J	CHIP R 68 J 1/16W	
R58 ,59			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R60			RK73HB1J470J	CHIP R 47 J 1/16W	
R61			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R62			RK73HB1J221J	CHIP R 220 J 1/16W	
R63			RK73HB1J224J	CHIP R 220K J 1/16W	
R64			RK73HB1J104J	CHIP R 100K J 1/16W	
R65			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R66			RK73HB1J153J	CHIP R 15K J 1/16W	
R67			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R68 ,69			RK73HB1J104J	CHIP R 100K J 1/16W	
R70			RK73HB1J470J	CHIP R 47 J 1/16W	
R71			RK73HB1J224J	CHIP R 220K J 1/16W	
R72			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R73			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R74			RK73HB1J104J	CHIP R 100K J 1/16W	
R75			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R80			RK73HB1J151J	CHIP R 150 J 1/16W	
R81			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R82			RK73HB1J270J	CHIP R 27 J 1/16W	
R83			RK73HB1J561J	CHIP R 560 J 1/16W	
R84			RK73HB1J180J	CHIP R 18 J 1/16W	
R85			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R86			R92-1368-05	CHIP R 0 OHM	
R87			RK73HB1J680J	CHIP R 68 J 1/16W	
R89			R92-1368-05	CHIP R 0 OHM	
R90			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R91			RK73HB1J334J	CHIP R 330K J 1/16W	
R92			RK73HB1J104J	CHIP R 100K J 1/16W	
R93			RK73HB1J561J	CHIP R 560 J 1/16W	
R94			RK73HB1J221J	CHIP R 220 J 1/16W	
R95			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R96			RK73HB1J391J	CHIP R 390 J 1/16W	
R97			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R98			RK73HB1J470J	CHIP R 47 J 1/16W	
R99			RK73HB1J103J	CHIP R 10K J 1/16W	
R100			RK73HB1J334J	CHIP R 330K J 1/16W	
R101			RK73HB1J470J	CHIP R 47 J 1/16W	
R102			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R103			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R104			RK73HB1J473J	CHIP R 47K J 1/16W	
R105			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R106			RK73HB1J103J	CHIP R 10K J 1/16W	
R107			RK73HB1J223J	CHIP R 22K J 1/16W	
R108			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R110			RK73HB1J223J	CHIP R 22K J 1/16W	
R113			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R114-116			RK73HB1J103J	CHIP R 10K J 1/16W	
R117			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R118			RK73HB1J274J	CHIP R 270K J 1/16W	
R119			RK73HB1J154J	CHIP R 150K J 1/16W	
R120			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R121			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R122			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R123			RK73HB1J561J	CHIP R 560 J 1/16W	

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
R124			RK73HB1J224J	CHIP R 220K J 1/16W	
R125			RK73HB1J683J	CHIP R 68K J 1/16W	
R126,127			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R128			RK73HB1J104J	CHIP R 100K J 1/16W	
R129			RK73HB1J220J	CHIP R 22 J 1/16W	
R130			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R131			RK73HB1J104J	CHIP R 100K J 1/16W	
R132			RK73HB1J221J	CHIP R 220 J 1/16W	
R133			RK73HB1J224J	CHIP R 220K J 1/16W	
R134-136			RK73HB1J104J	CHIP R 100K J 1/16W	
R137			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R138			RK73HB1J103J	CHIP R 10K J 1/16W	
R139			RK73HB1J104J	CHIP R 100K J 1/16W	
R140			RK73HB1J823J	CHIP R 82K J 1/16W	
R141			RK73HB1J103J	CHIP R 10K J 1/16W	
R142			RK73HB1J563J	CHIP R 56K J 1/16W	
R143			RK73HB1J180J	CHIP R 18 J 1/16W	
R144			RK73HB1J471J	CHIP R 470 J 1/16W	
R145			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R146			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R147			RK73HB1J470J	CHIP R 47 J 1/16W	
R148			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R149			RK73HB1J104J	CHIP R 100K J 1/16W	
R150			R92-1252-05	CHIP R 0 OHM	
R151			RK73HB1J563J	CHIP R 56K J 1/16W	
R152-154			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R155			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R156			R92-1368-05	CHIP R 0 OHM	
R157			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R158			RK73HB1J221J	CHIP R 220 J 1/16W	
R159			RK73HB1J224J	CHIP R 220K J 1/16W	
R160			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R161,162			RK73HB1J224J	CHIP R 220K J 1/16W	
R300			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R302			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R304			RK73HB1J103J	CHIP R 10K J 1/16W	
R313			RK73HB1J223J	CHIP R 22K J 1/16W	
R314			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R316			RK73GB1J101J	CHIP R 100 J 1/16W	
R318			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R319			RK73HB1J101J	CHIP R 100 J 1/16W	
R320			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R321			RK73GB1J123J	CHIP R 12K J 1/16W	
R322,323			RK73HB1J103J	CHIP R 10K J 1/16W	
R324			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R325			RK73HB1J564J	CHIP R 560K J 1/16W	
R326,327			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R328,329			RK73HB1J393J	CHIP R 39K J 1/16W	
R330			RK73HB1J471J	CHIP R 470 J 1/16W	
R331			RK73HB1J274J	CHIP R 270K J 1/16W	
R332,333			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R334			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R337			RK73HB1J564J	CHIP R 560K J 1/16W	
R339			RK73HB1J100J	CHIP R 10 J 1/16W	
R340			RK73HB1J470J	CHIP R 47 J 1/16W	
R341			RK73HB1J471J	CHIP R 470 J 1/16W	
R343			RK73HB1J393J	CHIP R 39K J 1/16W	
R344			RK73GB1J103J	CHIP R 10K J 1/16W	
R345			RK73GB1J120J	CHIP R 12 J 1/16W	
R346			RK73HB1J474J	CHIP R 470K J 1/16W	

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
R347-349			RK73HB1J103J	CHIP R 10K J 1/16W	
R350			RK73HB1J101J	CHIP R 100 J 1/16W	
R351			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R352			RK73HB1J273J	CHIP R 27K J 1/16W	
R353			RK73HB1J224J	CHIP R 220K J 1/16W	
R354			R92-1368-05	CHIP R 0 OHM	
R355			RK73HB1J474J	CHIP R 470K J 1/16W	
R356			RK73HB1J471J	CHIP R 470 J 1/16W	
R357			RK73HB1J104J	CHIP R 100K J 1/16W	
R358			RK73HB1J474J	CHIP R 470K J 1/16W	
R360			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R361			RK73HB1J224J	CHIP R 220K J 1/16W	
R362			RK73HB1J101J	CHIP R 100 J 1/16W	
R363,364			RK73HB1J103J	CHIP R 10K J 1/16W	
R365,366			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R367			RN73HH1J104D	CHIP R 100K D 1/16W	
R368			RK73HB1J274J	CHIP R 270K J 1/16W	
R369			RK73HB1J101J	CHIP R 100 J 1/16W	
R370			RK73HB1J474J	CHIP R 470K J 1/16W	
R371			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R374			RK73HB1J100J	CHIP R 10 J 1/16W	
R375			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R377			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R378			RK73HB1J100J	CHIP R 10 J 1/16W	
R379			RK73HB1J221J	CHIP R 220 J 1/16W	
R380			RK73HB1J103J	CHIP R 10K J 1/16W	
R381			RK73HB1J473J	CHIP R 47K J 1/16W	
R382			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R383			RK73HB1J333J	CHIP R 33K J 1/16W	
R384			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R385			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R387 ,386			RK73HB1J824J	CHIP R 820K J 1/16W	
R388			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R389			RK73HB1J124J	CHIP R 120K J 1/16W	
R390			RK73HB1J473J	CHIP R 47K J 1/16W	
R391			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R392-394			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R395			RK73HB1J224J	CHIP R 220K J 1/16W	
R396			RK73HB1J334J	CHIP R 330K J 1/16W	
R397			RK73HB1J474J	CHIP R 470K J 1/16W	
R398			R92-1368-05	CHIP R 0 OHM	
R399			RK73HB1J393J	CHIP R 39K J 1/16W	
R400			RK73HB1J224J	CHIP R 220K J 1/16W	
R401			RK73HB1J563J	CHIP R 56K J 1/16W	
R402			RK73HB1J123J	CHIP R 12K J 1/16W	
R403			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R404			RK73HB1J473J	CHIP R 47K J 1/16W	
R405			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R406			RK73HB1J393J	CHIP R 39K J 1/16W	
R407,408			RK73HB1J103J	CHIP R 10K J 1/16W	
R409			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R410			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R411			RK73HB1J821J	CHIP R 820 J 1/16W	
R412			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R413			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R414			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R415,416			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R417			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R418			RK73HB1J821J	CHIP R 820 J 1/16W	
R419			RK73HB1J472J	CHIP R 4.7K J 1/16W	

PARTS LIST

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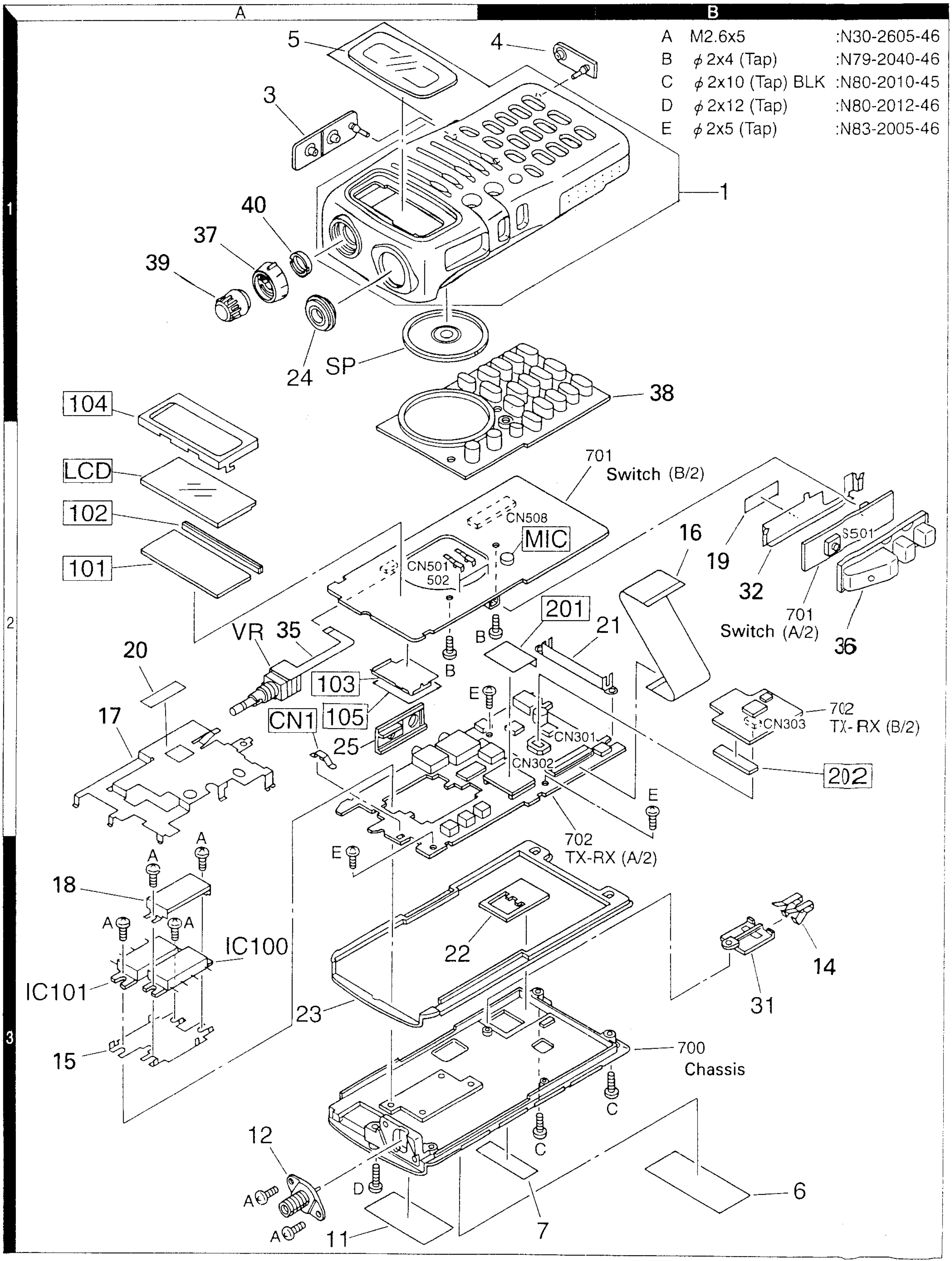
Ref.No.	Adrress	New parts	PartsNo.	Description	Destination
R420			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R421			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R422			RK73HB1J220J	CHIP R 22 J 1/16W	
R423			RK73HB1J563J	CHIP R 56K J 1/16W	
R424			RK73HB1J470J	CHIP R 47 J 1/16W	
R425,426			R92-1368-05	CHIP R 0 OHM	
R427			RK73HB1J474J	CHIP R 470K J 1/16W	
VR330,33			R12-7490-05	TRIMMING POT.(47K)	
D1,2			MA2S111	DIODE	
D3-6			MA2S077	DIODE	
D7			DA221	DIODE	
D8			MA2S077	DIODE	
D9		*	RB706F-40	DIODE	
D10			DA221	DIODE	
D11			HVU131	DIODE	
D12 -14		*	DAN235E	DIODE	
D15 -17			MA2S077	DIODE	
D18 ,19			HVC350B	VARIABLE CAPACITANCE DIODE	
D20			DA221	DIODE	
D21			HVU131	DIODE	
D22			MA2S077	DIODE	
D23 -25			HVC350B	VARIABLE CAPACITANCE DIODE	
D26			HVU131	DIODE	
D220		*	RB706F-40	DIODE	
D300			1SS357	DIODE	
D301			MA2S111	DIODE	
D302			DTZ3.9(B)	DIODE	T,E,E3
D302			DTZ3.9(B)	DIODE	M2,M3,M4
D319			MA2S111	DIODE	
D320			MAZS05600	ZENER DIODE	
D321			SFPB-72VL	DIODE	
D322			DA221	DIODE	
D323-325			RB751V-40	DIODE	
D326			MAZS05600	ZENER DIODE	
D327			DTZ3.9(B)	ZENER DIODE	
IC1		*	KCH36	HIC	
IC2			MB15A01	IC(PLL IC)	
IC3		*	TC4W66FU	IC	
IC4			MC3372SV	IC(LO POWER FMIC)	
IC5			TC4W53FU	IC(2 INPUT NAND GATE)	
IC8			TA75S01F	IC(OP AMP)	
IC301		*	UPD78054GK-538	IC(CPU)	K,K2
IC301		*	UPD78054GK-541	IC(CPU)	T,E,E3
IC301		*	UPD78054GK-541	IC(CPU)	M2,M3,M4
IC302,303			LMC7101BIM5	IC(OP AMP)	
IC305			S-81335HG-KI	IC	
IC306		*	RN5VT25A	IC	
IC307		*	RN5VL30C	IC	
IC308			TC7660SEOA	IC	
IC309		*	AT24C64N10SI18	IC(EEP ROM)	
IC311			AK2343	IC(CTCSS ENCODER/DECODER)	
IC312			KIA6278F	IC	
IC313			TC4W53FU	IC(2 INPUT NAND GATE)	
Q1,2			2SC4617(R)	TRANSISTOR	
Q3-6			2SC5108(Y)	TRANSISTOR	
Q7			2SA1832(GR)	TRANSISTOR	
Q8			2SC4738(GR)	TRANSISTOR	
Q9			2SC4649(N,P)	TRANSISTOR	
Q10			2SC4617(R)	TRANSISTOR	
Q11			2SC4649(N,P)	TRANSISTOR	
Q12 -14			2SC4617(R)	TRANSISTOR	
Q15			2SC3356	TRANSISTOR	
Q16			2SC5108(Y)	TRANSISTOR	
Q17			3SK239A	FET	
Q19			2SC3356	TRANSISTOR	
Q20 ,21			3SK239A	FET	
Q22			2SC4617(R)	TRANSISTOR	
Q23 -26			2SC5108(Y)	TRANSISTOR	
Q27			2SC4617(R)	TRANSISTOR	
Q28			DTC144EE	DIGITAL TRANSISTOR	
Q29			3SK239A	FET	
Q30			UMC4	TRANSISTOR	
Q31		*	UMX2N	TRANSISTOR	
Q300			2SC4617(R)	TRANSISTOR	
Q301			2SC4738(GR)	TRANSISTOR	
Q302			2SK1824	FET	
Q303			UMG1	TRANSISTOR	
Q304		*	UMA11N	TRANSISTOR	
Q305			UPA672T	FET	
Q306			UMC5	TRANSISTOR	
Q307			2SJ243	FET	
Q308			2SK1824	FET	
Q309			2SC4617(R)	TRANSISTOR	
Q310			2SK1588	FET	
Q312		*	2SB1184(Q,R)	TRANSISTOR	
Q313			2SC4617(R)	TRANSISTOR	
Q314		*	2SB1184(Q,R)	TRANSISTOR	
Q315			UMW1	TRANSISTOR	
Q316-319		*	UMA11N	TRANSISTOR	
Q320		*	UMA10N	TRANSISTOR	
Q321			2SD1483	TRANSISTOR	
Q322			2SB1188(Q)	TRANSISTOR	
Q323			2SK1588	FET	
Q324			UMC5	TRANSISTOR	
Q325			UPA572T	TRANSISTOR	
Q326			2SB1188(Q)	TRANSISTOR	
Q327			UMW1	TRANSISTOR	
Q328			2SK1824	FET	
Q329			2SC5108(Y)	TRANSISTOR	
TH330			TN103S472JT	THERMISTOR 4.7K	
TH700			157-104-65001	THERMISTOR 100K	

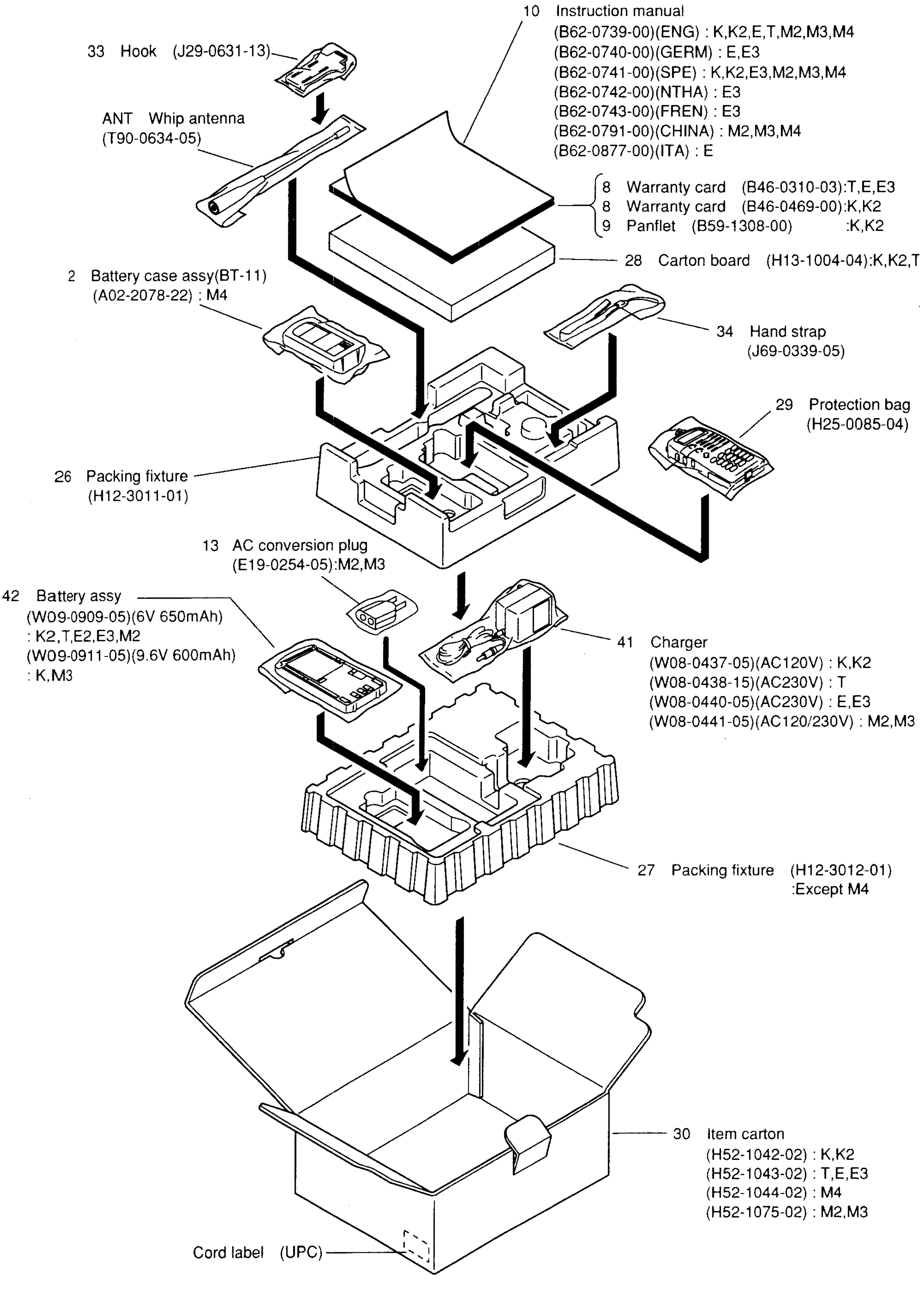
EXPLODED VIEW


A
B
1
2
3
5
4
3
1
40
37
39
24
SP
38
104
LCD
102
101
701
Switch (B/2)
CN508
MIC
CN501
502
16
19
32
S501
701
Switch (A/2)
36
VR
35
B
B
201
21
20
17
103
105
CN1
25
E
CN301
CN302
702
TX-RX (B/2)
CN303
202
E
702
TX-RX (A/2)
E
18
A
A
A
A
IC100
IC101
22
14
31
23
15
700
Chassis
C
C
12
A
A
D
6
11
7

A	M2.6x5	:N30-2605-46
B	ϕ 2x4 (Tap)	:N79-2040-46
C	ϕ 2x10 (Tap) BLK	:N80-2010-45
D	ϕ 2x12 (Tap)	:N80-2012-46
E	ϕ 2x5 (Tap)	:N83-2005-46

Parts with the exploded numbers larger than 700 are not supplied.

PACKING


10 Instruction manual
(B62-0739-00)(ENG) : K,K2,E,T,M2,M3,M4
(B62-0740-00)(GERM) : E,E3
(B62-0741-00)(SPE) : K,K2,E3,M2,M3,M4
(B62-0742-00)(NTHA) : E3
(B62-0743-00)(FREN) : E3
(B62-0791-00)(CHINA) : M2,M3,M4
(B62-0877-00)(ITA) : E
33 Hook (J29-0631-13)
ANT Whip antenna
(T90-0634-05)
8 Warranty card (B46-0310-03):T,E,E3
8 Warranty card (B46-0469-00):K,K2
9 Panflet (B59-1308-00) :K,K2
28 Carton board (H13-1004-04):K,K2,T
2 Battery case assy(BT-11)
(A02-2078-22) : M4
34 Hand strap
(J69-0339-05)
29 Protection bag
(H25-0085-04)
26 Packing fixture
(H12-3011-01)
13 AC conversion plug
(E19-0254-05):M2,M3
42 Battery assy
(W09-0909-05)(6V 650mAh)
: K2,T,E2,E3,M2
(W09-0911-05)(9.6V 600mAh)
: K,M3
41 Charger
(W08-0437-05)(AC120V) : K,K2
(W08-0438-15)(AC230V) : T
(W08-0440-05)(AC230V) : E,E3
(W08-0441-05)(AC120/230V) : M2,M3
27 Packing fixture (H12-3012-01)
:Except M4
30 Item carton
(H52-1042-02) : K,K2
(H52-1043-02) : T,E,E3
(H52-1044-02) : M4
(H52-1075-02) : M2,M3
Cord label (UPC)

ADJUSTMENT

REQUIRED TEST EQUIPMENT

1. Stabilized Power Supply

① The supply voltage can be changed between 3V and 16V and the current is 1A or more.
② The standard voltage is 13.8V.

2. DC Ammeter (DC.A)

① Class 1 ammeter (17 ranges and other features)
② The full scale can be switched between 300 mA and 3A.
③ A cable with low internal loss must be used.

3. Frequency Counter (f. counter)

① Frequencies of up to 1 GHz or so can be measured.
② The sensitivity can be changed to 250 MHz or below and measurements are highly stable and accurate (about 0.2 ppm).

4. Power Meter (terminal type)

① Measurable frequency: Up to 500 MHz
② Impedance: 50 Ω, unbalanced
③ Measuring range: Full scale of 10W
④ The specified special connection cable must be used.

5. RF VTVM (RF V.M)

① Measurable frequency: Up to 500 MHz or so

6. Linear Detector

① Measurable frequency: Up to 500 MHz
② Characteristic is flat and CN is 60 dB or more.

7. Digital Voltmeter

① Voltage range: FS = 18V or so
② Input resistance: 1 M Ω or more

8. Oscilloscope

① Measuring range: DC to 30 MHz
② Provides highly accurate measurements for 5 to 25 MHz

9. AF Voltmeter (AF V.M)

① Measurable frequency: 50 Hz to 1 MHz
② Maximum sensitivity: 1 mV or more

10. Spectrum Analyzer

① Measuring range: DC to 1 GHz or more

11. Standard Signal Generator (SSG)

① Maximum frequency: 500 MHz or more
② Output: -133 dBm (0.05 μV) to -13 dBm (50mV)
③ Output impedance: 50 Ω

12. Tracking Generator

① Center frequency: 50 kHz to 200 MHz
② Frequency deviation: ± 35 MHz
③ Output voltage: 100 mV or more

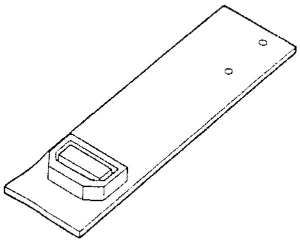
13. Dummy Load

① 8 Ω, 3W or more

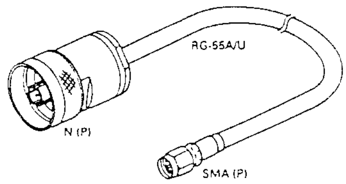
Preparations

- Use a non-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils).
- To protect the SSG, do not send out signals while adjusting the receiving unit.
- The SSG output levels give the values are for maximum output. Also, unless otherwise specified, use the standard modulation (modulation: 1 kHz, deviation: ± 3 kHz).

Adjustment service jig



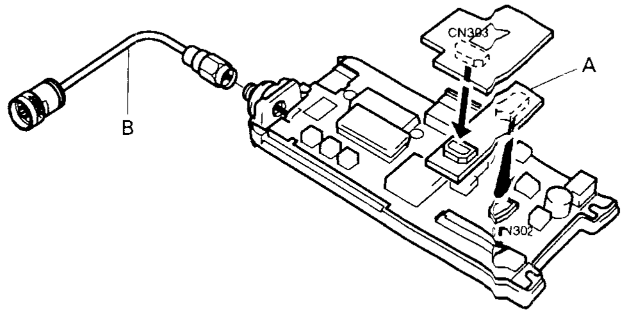
A : Connector P board
(W05-0663-00)



B : Antenna cable (length 1 m)
(E30-3226-05)

Service jig usage method

- First, insert the connector P board jig (W05-0663-00) into the daughter P board (TX-RX unit: B/2).
- Next, insert the other end into the main unit side (TX-RX unit: A/2).



TH-G71A/E

ADJUSTMENT

How to use the "Set Mode"

About the Set mode

When this TH-G71A/E is set to Set mode, the following levels can be set.

1. The squelch critical point for each band
2. The S meter first lighting for each band
3. The S meter all lighting for each band
4. The HI/LO/EL transmission output for each band
5. The reference voltage for overvoltage alarms (13.8V)

The levels set with set mode are written into the E^2PROM. Therefore, this data is retained even if the power is cut off or the device is reset.

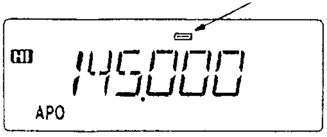
When the E^2PROM is replaced, it is necessary to write (set) all these items again.

Setting procedure

1. Open up the main unit and with the power ON, briefly short the Set points (see figure below) on the component side of the switch unit (B/2) (with tweezers or the like).
   The beeper beeps and the ▭ mark flashes on the display to show that the device has entered Set mode.
2. The functions of the keys in Set mode are as follows.

(1) :Squelch critical point setting
(2) :S meter S1 (1st lighting) level setting
(3) :S meter S5 (all lighting) level setting
(4) :Overvoltage alarm reference voltage (13.8V) identification setting
(5) :Overvoltage alarm check mode (alarm beeps)
(6) :Ending (5)
(PTT) + (0) + (ENC): Transmission output level setting
(BAND) : 144/430MHz bands
(LOW) :Transmission output (HI/LO/EL) switching
(In Set mode, the F key are not accepted.)

For 144MHz bands



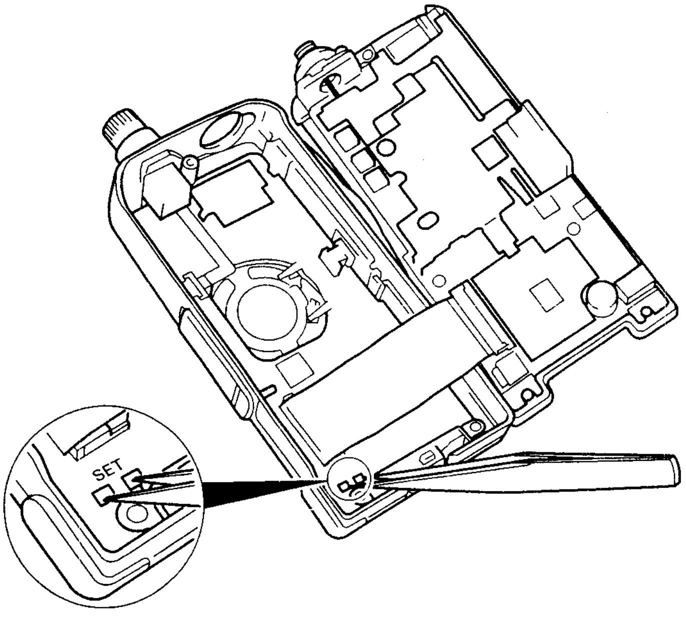
3. Input the SSG level to be set for each band from the ANT terminal and press the Set key. (See table below.)

Key pressed / Band (SSG frequency)	SQ level (1)	S1 level (2)	S5 level (3)
VHF Band 145.020MHz:E,T 146.020MHz:K,M	-124dBm	-120dBm	-105dBm
UHF Band 435.020MHz:E,T 445.020MHz:K,M	-124dBm	-120dBm	-105dBm
AIR Band 118.000MHz	-124dBm	-120dBm	-105dBm
300MHz Band 340.000MHz	-124dBm	-120dBm	-105dBm
800MHz Band 860.000MHz	-124dBm	-120dBm	-105dBm

Note : The SSG uses standard modulation.

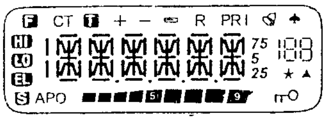
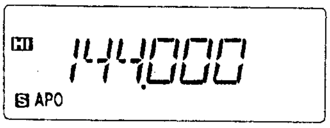
4. Overvoltage alarm reference voltage (13.8V) identification setting
   Apply the terminal voltage 13.8V ± 0.05V from the stabilized power supply to the external power supply terminal (DC-IN), then press the (4) key.
   Next, press the (5) key and check that the alarm sounds.
5. Set mode is ended by switching OFF the power.

Note 1 : Since these settings overwrite the previous data, they can be set independently and in any order.

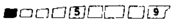


ADJUSTMENT

Section common to transmission and reception

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting and reset	1) External power supply connection DC-IN terminal voltage: 13.8V 2) All-lit display check While pressing the F key, switch the POWER switch ON. 3) All reset Within ten seconds after the all-lit display, press the F key again.	LCD all-lit display  F CT T + – R PRI 75 5 25 HI LO EL S APO 5 9			Default setting display after all reset  			

VHF reception section

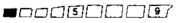
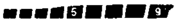
Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Helical (BPF)	1) Tracking generating output:-45 dBm Center:145.000 MHz:E,T 146.000 MHz:K,M Span:50 MHz REF:-20 dBm	Tracking generator Spectrum analyzer	TX-RX (A/2)	ANT TP	TX-RX (A/2)	L41 L40 L39	The maximum level of the two markers is aligned to within 2 dB.	See Figure 1.
2. Large input S/N	1) Frequency:145.020 MHz:E,T 146.020 MHz:K,M SSG:-53dBm	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load		ANT SP			S/N check (AF・VR:0.63V/8 Ω) Audio output check (AF・VR:MAX)	35 dB or more. 1.3V or more.
3. Sensitivity	1) Frequency:144.020MHz SSG:-121dBm AF・VR:0.63V/8 Ω 2) Frequency:145.020MHz:E,T 146.020MHz:K,M						Check	12 dB SINAD or more.
4. Current consumption	1) Frequency:144.020MHz SSG:OFF						Check	70 mA or less.
5. S meter	1) Frequency:144.020MHz SSG:-120dBm ± 6dBm	SSG Oscilloscope		ANT SP		LCD	Check	 At least one lit
	2) SSG:-105dBm ± 6dBm							All lit
6. Squelch	1) Frequency:144.020MHz SSG:OFF						Check	Squelch must be closed.
	2) SSG:-112dBm							Squelch must be opened.

VHF transmission section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1 Transmission output	1) BATT・IN:9.6V Frequency:145.060MHz:M,E,T 146.060MHz: K Set to Set mode.	Power meter DC・A	TX-RX (A/2)	ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 5.0W.	± 0.2W
	2) Transmission output switching: HI PTT transmission Press 0 key during transmission. After setting, press 0 key again. Return to PTT.							(Less than 1.8A)
	3) DC・IN:6.0V ransmission output switching: LO Same method as 2)						Adjust to 0.5W.	± 0.1W
	4) DC・IN:6.0V Transmission output switching: EL Same method as 2)						Adjust to 50 mW.	± 10mW
2. DEV	1) Frequency:145.060MHz: M,E,T 146.060MHz: K AG:1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	TX-RX (A/2)	VR331	Adjust to 4.2 kHz with larger ±.	± 100Hz
	2) AG: 20 dB down: (1 kHz/7 mV) PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	± 1.8~2.6kHz

ADJUSTMENT

UHF reception section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Large input S/N	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-53dBm AF・VR:0.63V/8 Ω	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load	TX-RX (A/2)	ANT SP			Check	35dB or more.
2. Sensitivity	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-121dBm						Check	12dB SINAD or more.
	2) Frequency:435.020MHz:M,E,T :445.020MHz:K							
3. Current consumption	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:OFF						Check	70mA or less.
4. S meter	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-120dBm ± 6dBm	SSG Oscilloscope	TX-RX (A/2)	ANT SP		LCD	Check	 At least one lit
	2) SSG:-105dBm ± 6dBm							All lit 
5. Squelch	1) Frequency:435.020MHz:M,E,T :445.020MHz:K SSG:OFF						Check	Squelch must be closed.
	2) SSG:-112dBm							Squelch must be closed.

UHF transmission section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission frequency	1) Frequency:439.980MHz:M,E,T :449.980MHz:K PTT:ON	Power meter F counter	TX-RX (A/2)	ANT	TX-RX (A/2)	TC1	Set to display frequency	± 200Hz
2. Transmission output	1) BATT・IN:9.6V Frequency:435.060MHz:M,E,T :445.060MHz:K Set to Set mode.	Power meter DC-A		ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 5.0W.	± 0.2W
	2) Transmission output switching: HI PTT transmission Press 0 key during transmission. After setting, press 0 key again. Return to PTT.							(Less than 1.9A)
	3) DC・IN:6.0V Transmission output switching: LO Same method as 2)						Adjust to 0.5W.	± 0.1W
	4) DC・IN:6.0V Transmission output switching: EL Same method as 2)						Adjust to 50 mW.	± 10mW
3. DEV	1) Frequency:435.060MHz:M,E,T :445.060MHz:K AG:1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	TX-RX (A/2)	VR330	Adjust to 4.2 kHz with larger ±.	± 100Hz
	2) AG:20dB down:1 kHz/7 mV PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	± 1.8~2.6kHz
4. DTMF DEV	1) In transmitted state, press the D key.						DTMF DEV Check	± 2.2~4.2kHz
5. TONE DEV	1) Frequency:435.060MHz:M,E,T :445.060MHz:K Press F key → 6 key to display "CT". PTT:ON						Display check TONE DEV Check	"CT" display lit ± 0.4~1.2kHz

ADJUSTMENT

118,300,800MHz Band reception section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
Sensitivity	118MHz Band 1) Frequency:118.000MHz SSG:-121dBm	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load	TX-RX (A/2)	ANT SP			Check	12dB SINAD or more
	300MHz Band 2) Frequency:340.000MHz SSG:-121dBm							
	800MHz Band 3) Frequency:860.000MHz SSG:-117dBm							

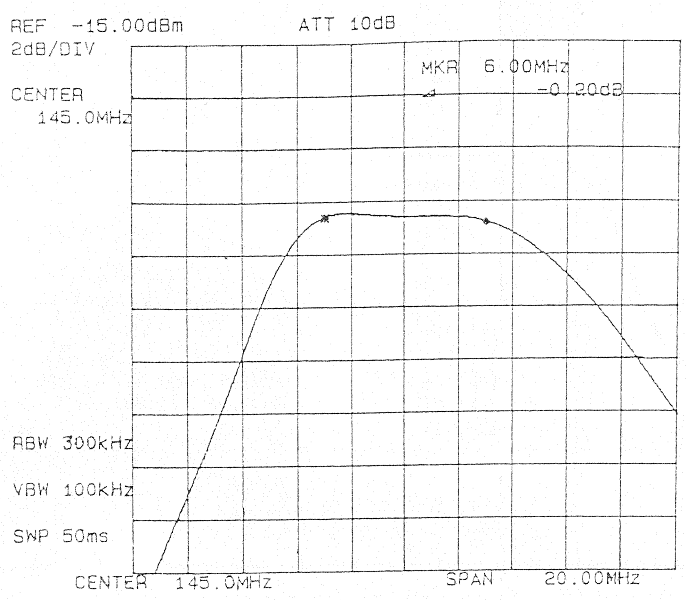
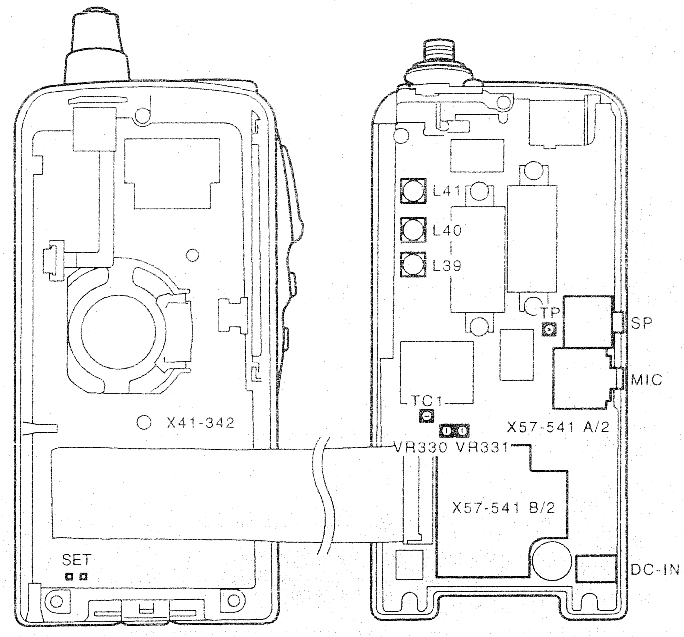


Figure 1. Helical (BPF) Adjustment Waveform
VHF Band

Parts layout diagram


X41-342
SET
L41
L40
L39
TP
SP
MIC
TC1
X57-541 A/2
VR330 VR331
X57-541 B/2
DC-IN

SWITCH unit

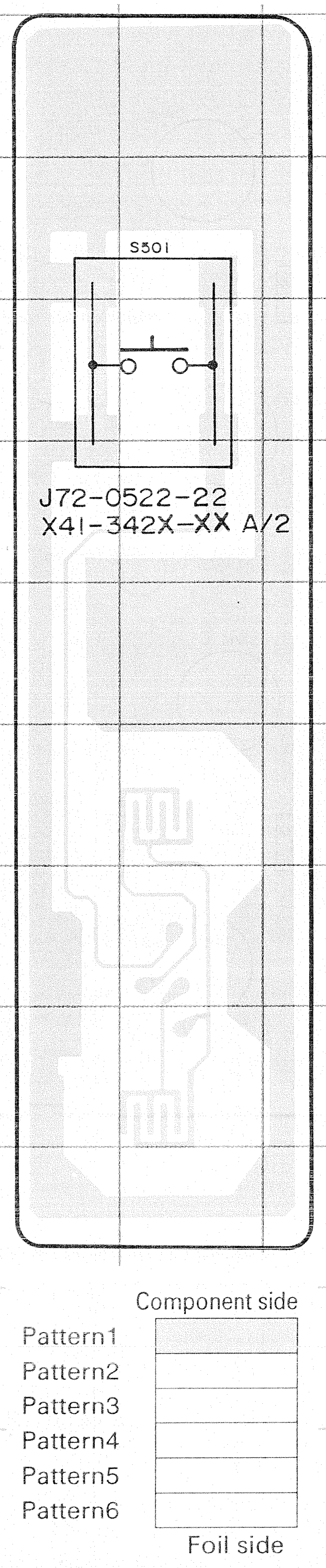
SET : Set mode test point

TX-RX unit (A/2)

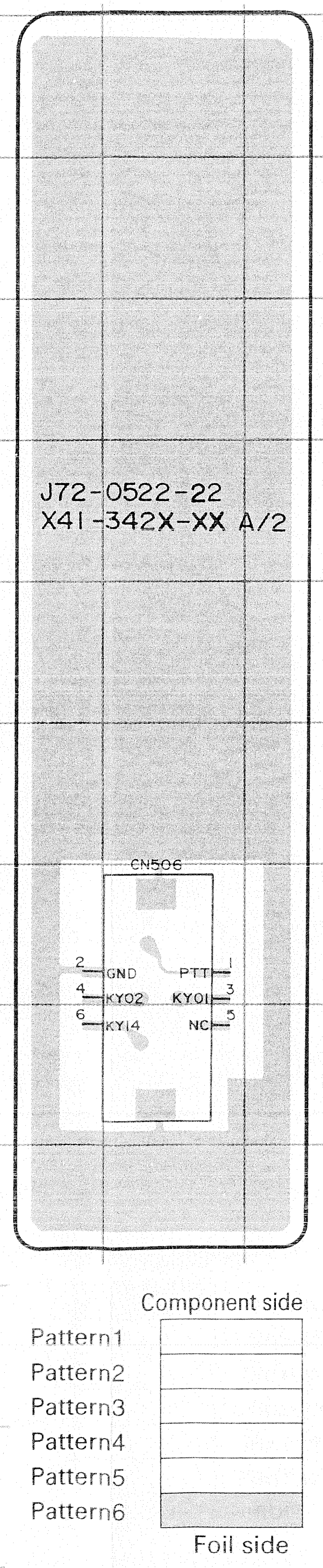
L41,40,39 : VHF helical
TC1 : Transmission frequency (UHF)
VR330 : DEV(UHF)
VR331 : DEV(VHF)
TP : Helical adjustment (spectrum analyzer point)

PC BOARD VIEWS

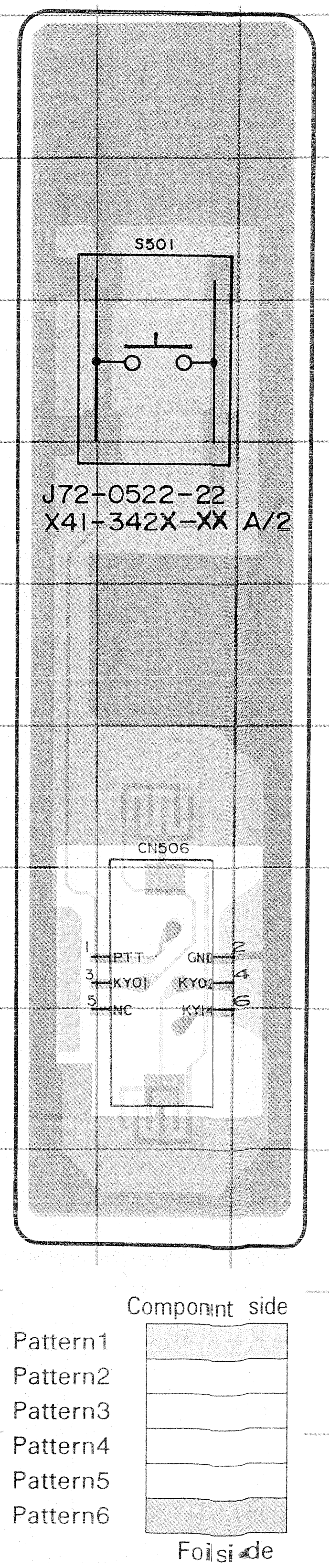
PTT UNIT (X41-342X-XX) (A/2) Component Side View 0-11:K,K2,0-21:M2,M3 ,M4,2-71:T,E,E3


S501
J72-0522-22
X41-342X-XX A/2
Component side
Pattern1
Pattern2
Pattern3
Pattern4
Pattern5
Pattern6
Foil side

PTT UNIT (X41-342X-XX) (A/2) Foil Side View 0-11:K,K2,0-21:M2,M3 ,M4,2-71:T,E,E3

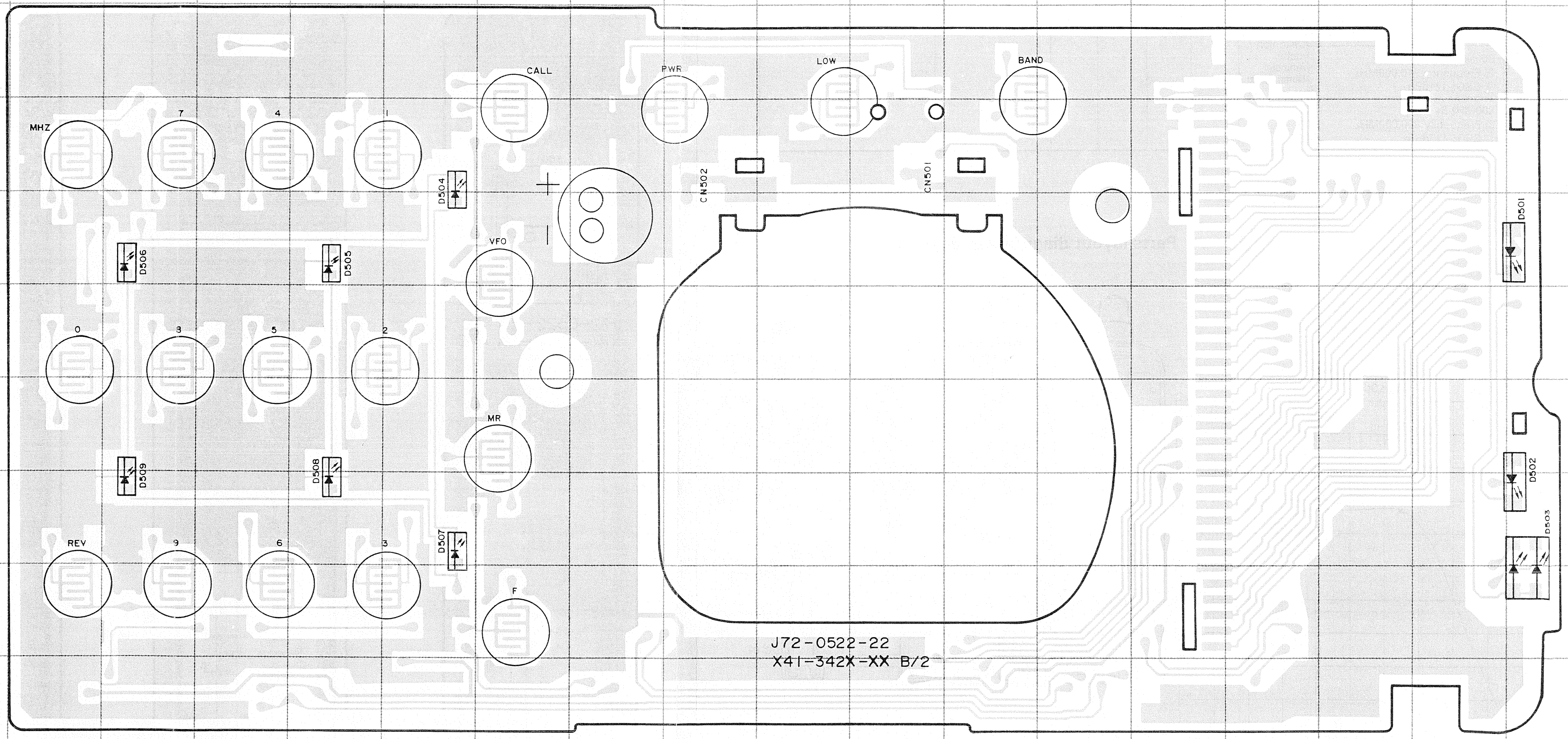

J72-0522-22
X41-342X-XX A/2
CN506
2
GND
PTT
1
4
KY02
KY01
3
6
KY14
NC
5
Component side
Pattern1
Pattern2
Pattern3
Pattern4
Pattern5
Pattern6
Foil side

PTT UNIT(X41-342X-XX) (A/2)Component Side View+Foil Side View 0-11:K,K2,0-21:M2,M3 ,M4,2-71:T,E,E3


S501
J72-0522-22
X41-342X-XX A/2
CN506
1
PTT
GND
2
3
KY01
KY02
4
5
NC
KY14
6
Component side
Pattern1
Pattern2
Pattern3
Pattern4
Pattern5
Pattern6
Foil side

TH-G71A/E PC BOARD VIEWS

KEY UNIT (X41-342X-XX)(B/2) Component Side View
0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3


CALL
PWR
LOW
BAND
MHZ
7
4
1
D504
CN502
CN501
D501
D506
D505
VFO
0
8
5
2
MR
D509
D508
D502
D503
REV
9
6
3
D507
F
J72-0522-22
X41-342X-XX B/2

Component side

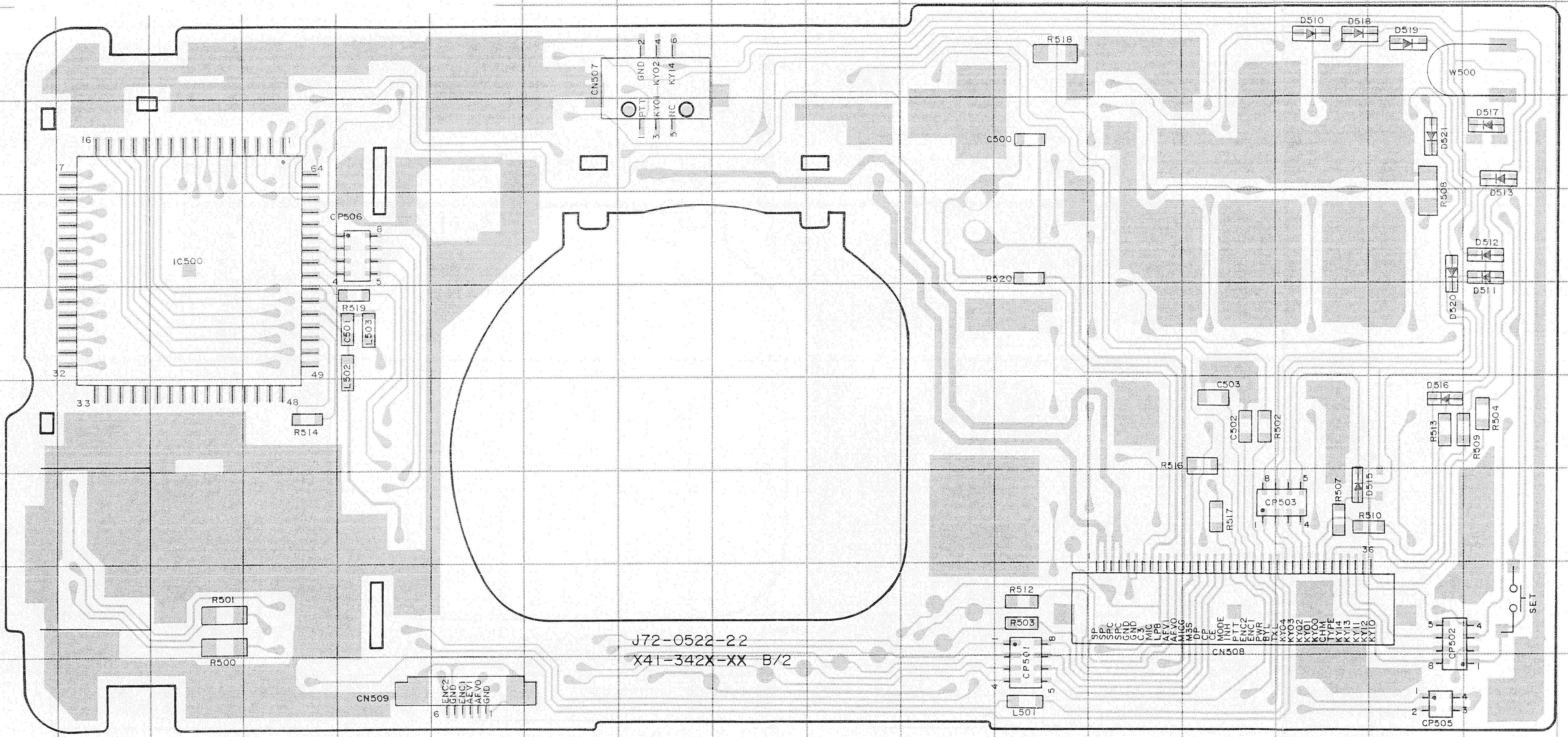
Pattern1	▨
Pattern2	
Pattern3	
Pattern4	
Pattern5	
Pattern6	

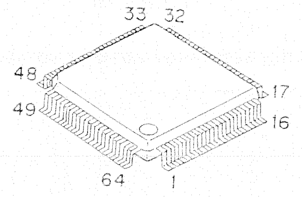
Foil side

KEY UNIT (X41-342X-XX)
(B/2)(Component side)

Ref.NO.	Address
D501	5S
D502	8S
D503	8S
D504	4G
D505	5F
D506	5D
D507	8G
D508	7F
D509	8D

KEY UNIT (X41-342X-XX)(B/2) Foil Side View
0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3


A B C D E F G H I J K L M N O P Q R S
IC500
16
17
64
32
49
33
48
CP506
R519
C501
L503
L502
R514
R501
R500
CN507
GND
KY02
KY14
PTT
KY01
NC
1
2
3
4
5
6
CN509
ENC2
GND
ENC1
AEV1
AFV0
GND
J72-0522-22
X41-342X-XX B/2
R518
C500
R520
R512
R503
CP501
L501
D510
D518
D519
W500
D517
D521
R508
D513
D512
D520
D511
C503
C502
R502
D516
R513
R509
R504
R516
R517
CP503
R507
D515
R510
36
CN508
SP
SPC
SPC
GND
GND
C3
MIC
LPB
AFV1
AFVO
MICG
M3S
DP
CP
CE
MODE
INH
PTT
ENC2
ENC1
PWR
BYL
TXL
KYO4
KYO3
KYO2
KYO1
KYO0
CHM
TYPE
KYI4
KYI3
KYI1
KYI2
KYI0
SET
CP502
CP505


33
32
48
49
17
16
64
1

NJU6433F

Component side

Pattern1 ☐
Pattern2 ☐
Pattern3 ☐
Pattern4 ☐
Pattern5 ☐
Pattern6 ▨

Foil side

KEY UNIT (X41-342X-XX)
(B/2)(Foil side)

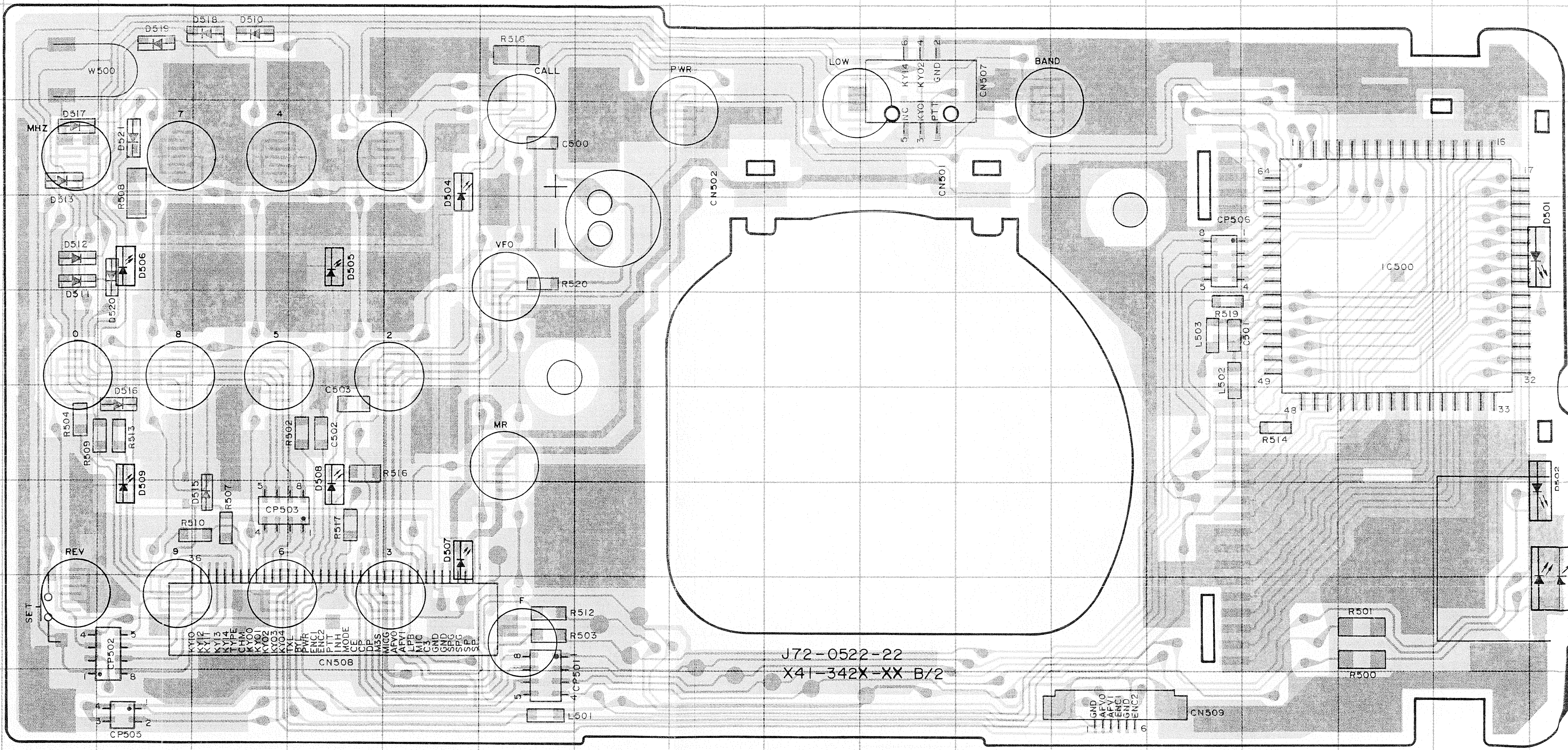
Ref.NO.	Address
IC500	5C
D510	3O
D511	5Q
D512	5Q
D513	4Q
D515	8O
D516	7P
D517	4Q
D518	3O
D519	3P
D520	5P
D521	4P

TH-G71A/E PC BOARD VIEWS

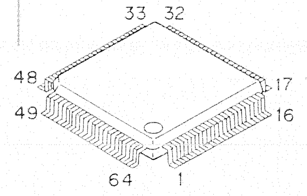
KEY UNIT (X41-342X-XX)
(B/2)(Component side) + (Foil side)

Ref.NO.	Address
IC500	5Q
D501	5S
D502	8S
D503	8S
D504	4G
D505	5F
D506	5D
D507	8G
D508	8F
D509	8D
D510	3E
D511	5C
D512	5C
D513	4C
D515	8E
D516	7D
D517	4C
D518	3E
D519	3D
D520	5D
D521	4D

KEY UNIT(X41-342X-XX)(B/2) Component Side View+Foil Side View
0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3


D519
D518
D510
W500
MHZ
D517
D513
D521
R508
D512
D511
D506
D520
D505
D504
R516
CALL
C500
PWR
LOW
KY14
KY02
GND
INC
KY01
PTT
CN507
BAND
CN502
CN501
VFO
R520
IC500
CP506
R519
L503
C501
L502
R514
D501
D502
D503
D516
C503
R504
R509
R513
D509
R502
C502
D508
R516
D515
R507
CP503
R510
R517
D507
REV
SET
CP502
CP505
MR
R512
R503
CP501
L501
CN508
KY10
KY11
KY12
KY13
TYPE
CHM
KY00
KY01
KY02
KY03
KY04
TXL
RXL
PWR
ENC1
ENC2
PTT
INH
MODE
CE
CL
DP
M5S
MEGG
AFV0
AFV1
LPB
MIC
C3
GND
GND
SPG
SPG
SP
R501
R500
CN509
GND
AFV0
AFV1
ENC1
INH
ENC2
J72-0522-22
X41-342X-XX B/2
0
1
2
3
4
5
6
7
8
9
15
17
32
33
48
49
64

	Component side
Pattern1	▨
Pattern2	☐
Pattern3	☐
Pattern4	☐
Pattern5	☐
Pattern6	▨
	Foil side

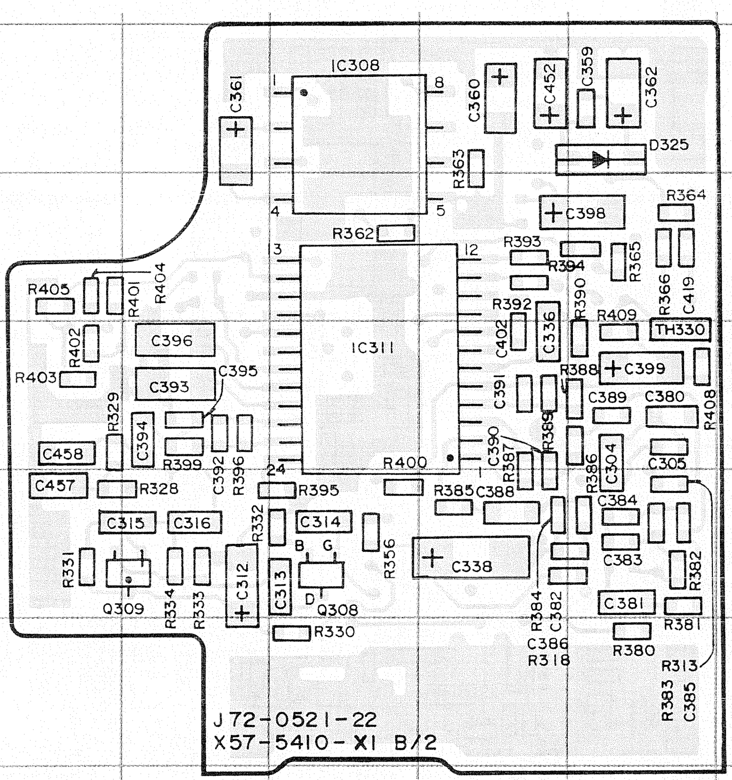

33
32
48
17
49
16
64
1

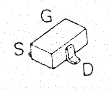
NJU6433F

A B C D E F G H I J K L M N O P Q R S

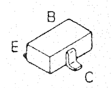
PC BOARD VIEWS TH-G71A/E

TX-RX UNIT (X57-5410-XX)(B/2) Component Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4

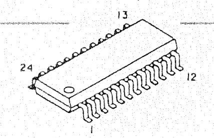

IC308
1
8
4
5
C361
C360
C452
C359
C362
D325
R363
C398
R364
R362
13
12
R393
R394
R365
R390
R366
C419
R405
R401
R404
R392
C336
R409
TH330
R402
C396
C395
IC311
C402
R388
C399
R403
C393
C391
R389
C389
C380
R408
R329
C394
C458
R399
R396
C392
24
R400
C390
R387
R386
C304
C305
C457
R328
R395
R385
C388
C384
C315
C316
R332
C314
B
G
R356
C338
C383
R382
R331
Q309
R334
R333
C312
C313
D
Q308
R330
R384
C382
C386
R318
C381
R381
R380
R313
R383
C385
J72-0521-22
X57-5410-XI B/2



2SK1824



2SC4617



AK2343

Component side

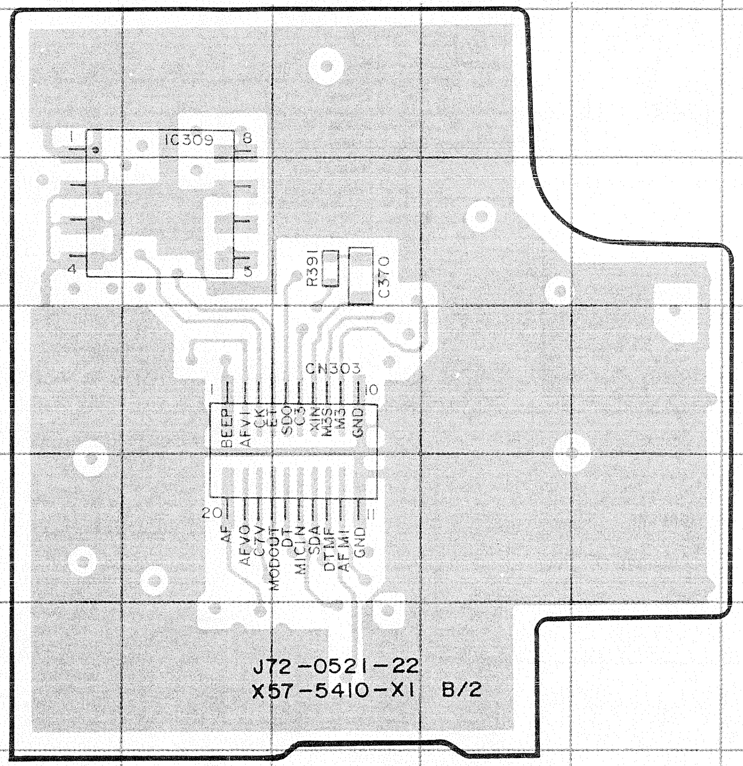
Pattern1 ▨
Pattern2 ☐
Pattern3 ☐
Pattern4 ☐
Pattern5 ☐
Pattern6 ☐

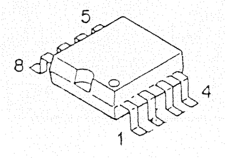
Foil side

TX-RX UNIT (X57-5410-XX)
(B/2)(Component side)

Ref.NO.	Address
IC308	4D
IC311	6D
Q308	7D
Q309	7C
D325	4F

TX-RX UNIT (X57-5410-XX)(B/2) Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4


IC309
1
8
4
5
R391
C370
CN303
1
10
20
11
BEEP
AFVI
CK
ET
SDO
C3
XIN
M3S
M3
GND
AF
AFVO
C7V
MODOUT
DT
MICIN
SDA
DTMF
AFMT
GND
J72-0521-22
X57-5410-XI B/2



AT24C64N10SI18

Component side

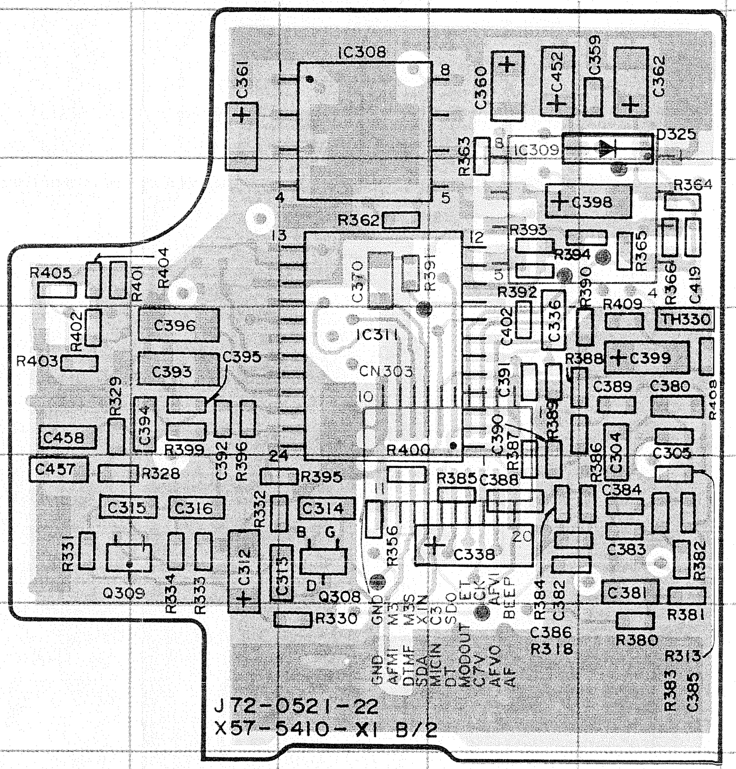
Pattern1 ☐
Pattern2 ☐
Pattern3 ☐
Pattern4 ☐
Pattern5 ☐
Pattern6 ▨

Foil side

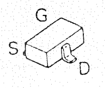
TX-RX UNIT (X57-5410-XX)
(B/2)(Foil side)

Ref.NO.	Address
IC309	5I

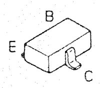
TX-RX UNIT(X57-5410-XX)(B/2)
Component Side View+Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4


IC308
1
8
4
5
C361
C360
C452
C359
C362
IC309
D325
R363
C398
R364
R362
13
12
R393
R394
R365
R390
R366
C419
R405
R401
R404
C370
R391
R392
C336
R409
TH330
R402
C396
C395
IC311
CN303
C402
R388
C399
R403
C393
C391
C389
C380
R408
R329
C394
C458
R399
R392
R396
24
10
R400
C390
R387
R386
C304
C305
C457
R328
R395
R385
C388
C384
C315
C316
R332
C314
B
G
R356
C338
20
C383
R382
R331
Q309
R334
R333
C312
C313
D
Q308
R330
GND
AFMT
DTMF
SDA
MICIN
DT
MODOUT
C7V
AFVO
AF
GND
M3
M3S
XIN
C3
SDO
ET
CK
AFVI
BEEP
R384
C382
C386
R318
C381
R381
R380
R313
R383
C385
J72-0521-22
X57-5410-XI B/2

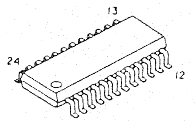
● Connect 1 and 6



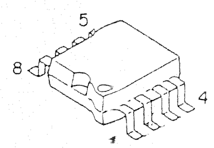
2SK1824



2SC4617



AK2343



AT24C64N10SI18

TX-RX UNIT (X57-5410-XX)
(B/2)(Component side) + (Foil side)

Ref.NO.	Address
IC308	4P
IC309	5Q
IC311	6P
Q308	7P
Q309	7O
D325	4R

Component side

Pattern1 ▨
Pattern2 ☐
Pattern3 ☐
Pattern4 ☐
Pattern5 ☐
Pattern6 ▨

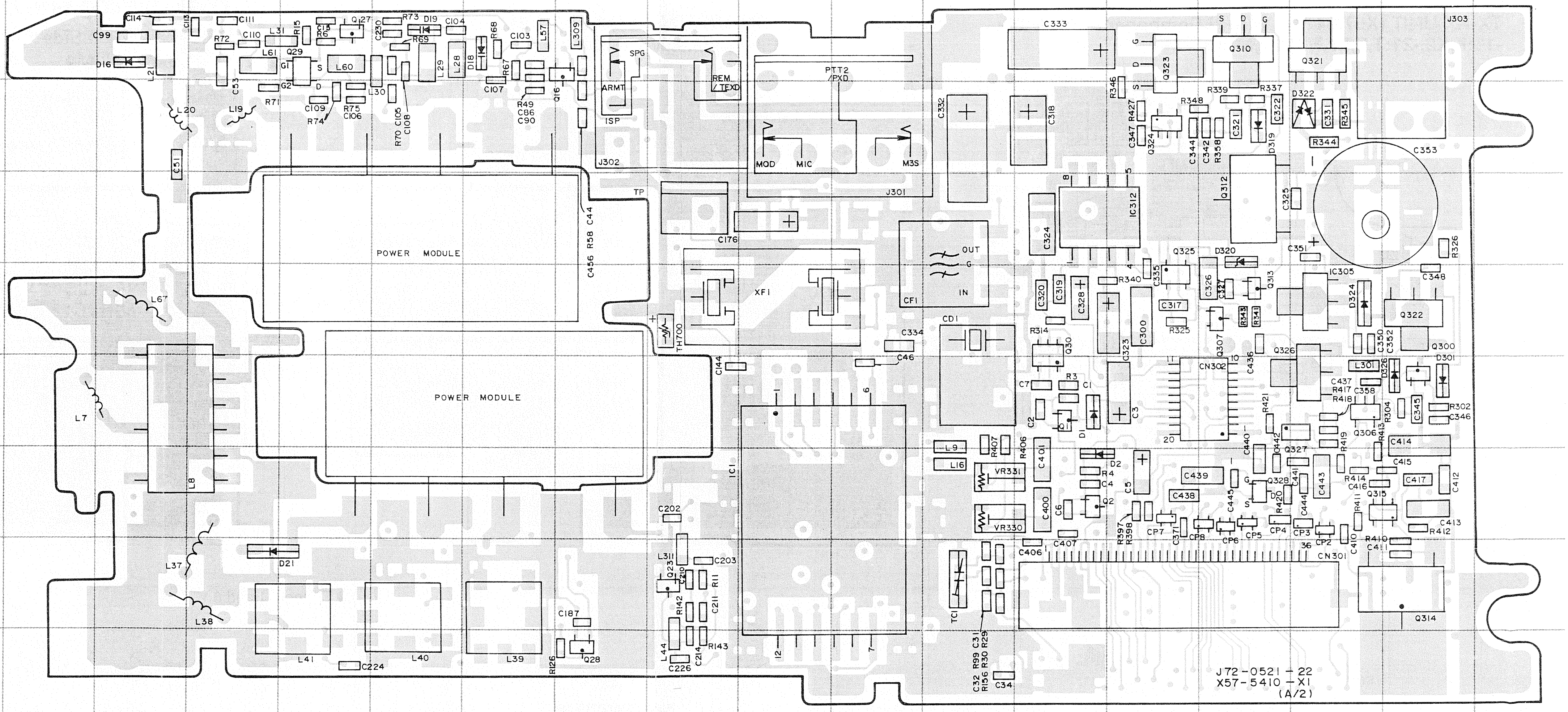
Foil sid

TH-G71A/E PC BOARD VIEWS

TX-RX UNIT (X57-5410-XX)(A/2) Component Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4

TX-RX UNIT (X57-5410-XX)
(A/2)(Component side)

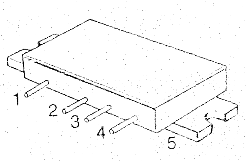
Ref.NO.	Address
IC1	8K
IC100	6F
IC101	4E
IC305	6Q
IC312	5O
Q1	7N
Q2	8N
Q16	3I
Q23	9J
Q27	3F
Q28	10I
Q29	3F
Q30	6N
Q300	6R
Q306	7Q
Q307	6P
Q310	3P
Q312	5P
Q313	6P
Q314	9R
Q315	8Q
Q321	3Q
Q322	6R
Q323	3O
Q324	4O
Q325	6O
Q326	7Q
Q327	7Q
Q328	8P
D1	7N
D2	8N
D16	3D
D18	3H
D19	3G
D21	9E
D301	7R
D319	4P
D320	5P
D322	4Q
D324	6Q
D326	7R


POWER MODULE
POWER MODULE
IC1
IC312
IC305
CN301
CN302
J301
J302
J303
ISP
SPG
ARMT
REM / TEXD
PTT2 /PXD
MOD
MIC
M3S
TP
XF1
CF1
OUT
G
IN
CD1
TH700
VR331
VR330
TC1
C333
C353
Q310
Q321
Q322
Q323
Q314
L7
L8
L20
L19
L67
L37
L38
L39
L40
L41
D21
Q28
C224
J72-0521-22
X57-5410-X1
(A/2)

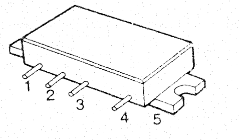
Component side

- Pattern1 ▨
- Pattern2
- Pattern3
- Pattern4
- Pattern5
- Pattern6

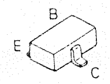
Foil side



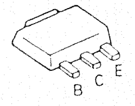
M67799MA



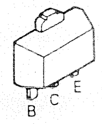
M67798LRA



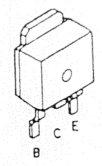
DTA114YE
DTC144EE
2SC4617
2SC5108



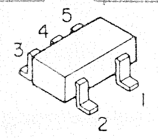
2SB1188



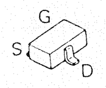
2SD1483



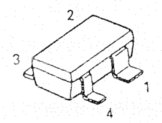
2SB1184



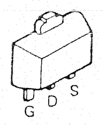
UMC4



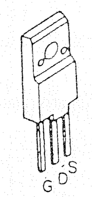
2SJ243



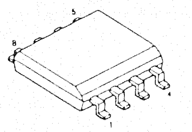
3SK239A

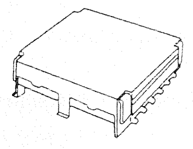


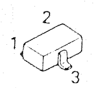
2SK1588



UPA572T

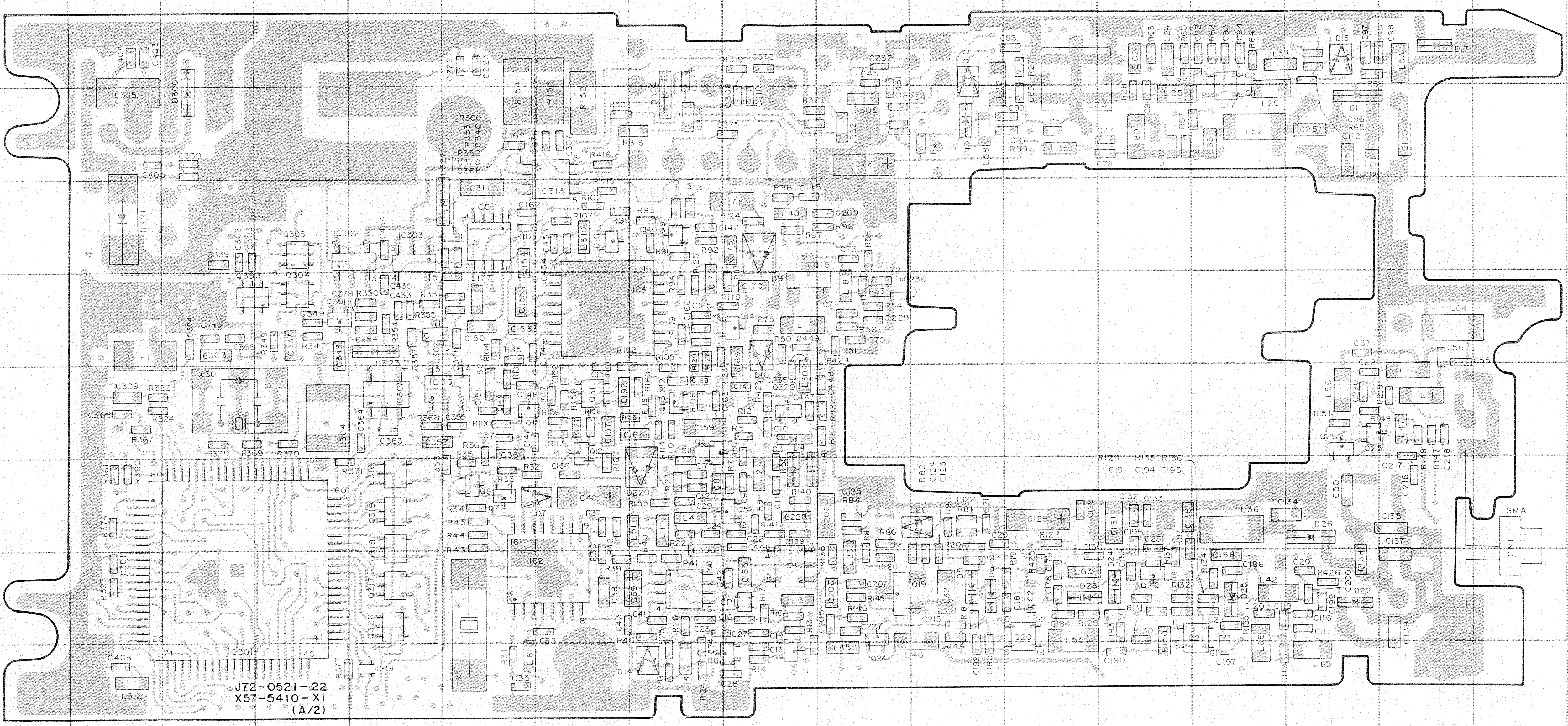

KIA6278F

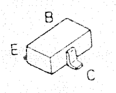

KCH36



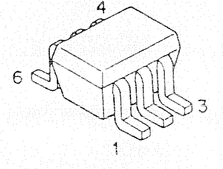
DA221

TX-RX UNIT (X57-5410-XX) (A/2)Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4

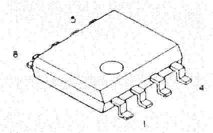

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
IC2
IC4
IC8
IC301
IC302
IC303
IC313
X301
X1
L305
L303
L312
F1
SMA
CN1
J72-0521-22
X57-5410-X1
(A/2)



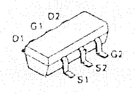
2SA1832
2SC3356
2SC4617
2SC4738
2SC5108



UMA10N
UMA11N



TC4W53FU



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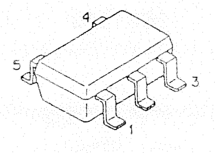
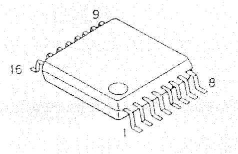
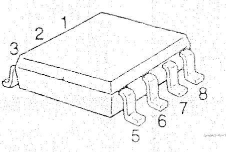


RN5VL30C
RN5VT25A



MB15A01



TC4W66FU

Component side

Pattern1

Pattern2

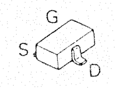
Pattern3

Pattern4

Pattern5

Pattern6 ▨

Foil side



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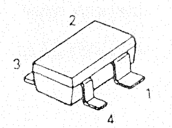
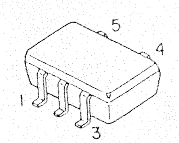


3SK239A



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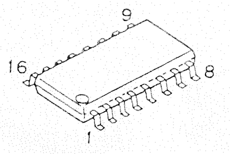

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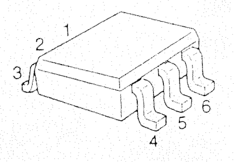


UMX2N

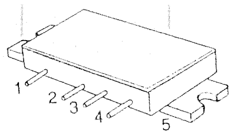
D17	3P
D20	8K
D22	9O
D23	9L
D24	9M
D25	9N
D26	8O
D220	8H
D300	4C
D302	4H
D321	5B
D323	6E
D327	5E

TX-RX UNIT (X57-5410-XX)
(A/2)(Foil side)

Ref.NO.	Address
IC2	9G
IC3	9H
IC4	6G
IC5	5F
IC8	9I
IC301	9C
IC302	5E
IC303	5E
IC306	7F
IC307	7E
IC313	4G
Q3	7H
Q4	10I
Q5	8I
Q6	10I
Q7	8F
Q8	8F
Q9	5H
Q10	5G
Q11	7F
Q12	7G
Q13	7H
Q14	6I
Q15	6I
Q17	4N
Q19	9J
Q20	9L
Q21	10N
Q22	9M
Q24	10J
Q25	7O
Q26	7O
Q31	7G
Q301	6D
Q302	6E
Q303	6C
Q304	6D
Q305	5D
Q316	8E
Q317	9E
Q318	8E
Q319	8E
Q320	9E
Q329	7I
D3	7I
D4	8I
D5	9K
D6	9K
D7	8F
D8	8I
D9	5I
D10	6I
D11	4O
D12	3K
D13	3O
D14	10H
D15	4K

TH-G71A/E PC BOARD VIEWS

TX-RX UNIT(X57-5410-XX)(A/2) Component Side View+Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4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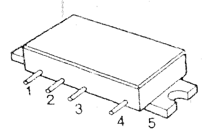
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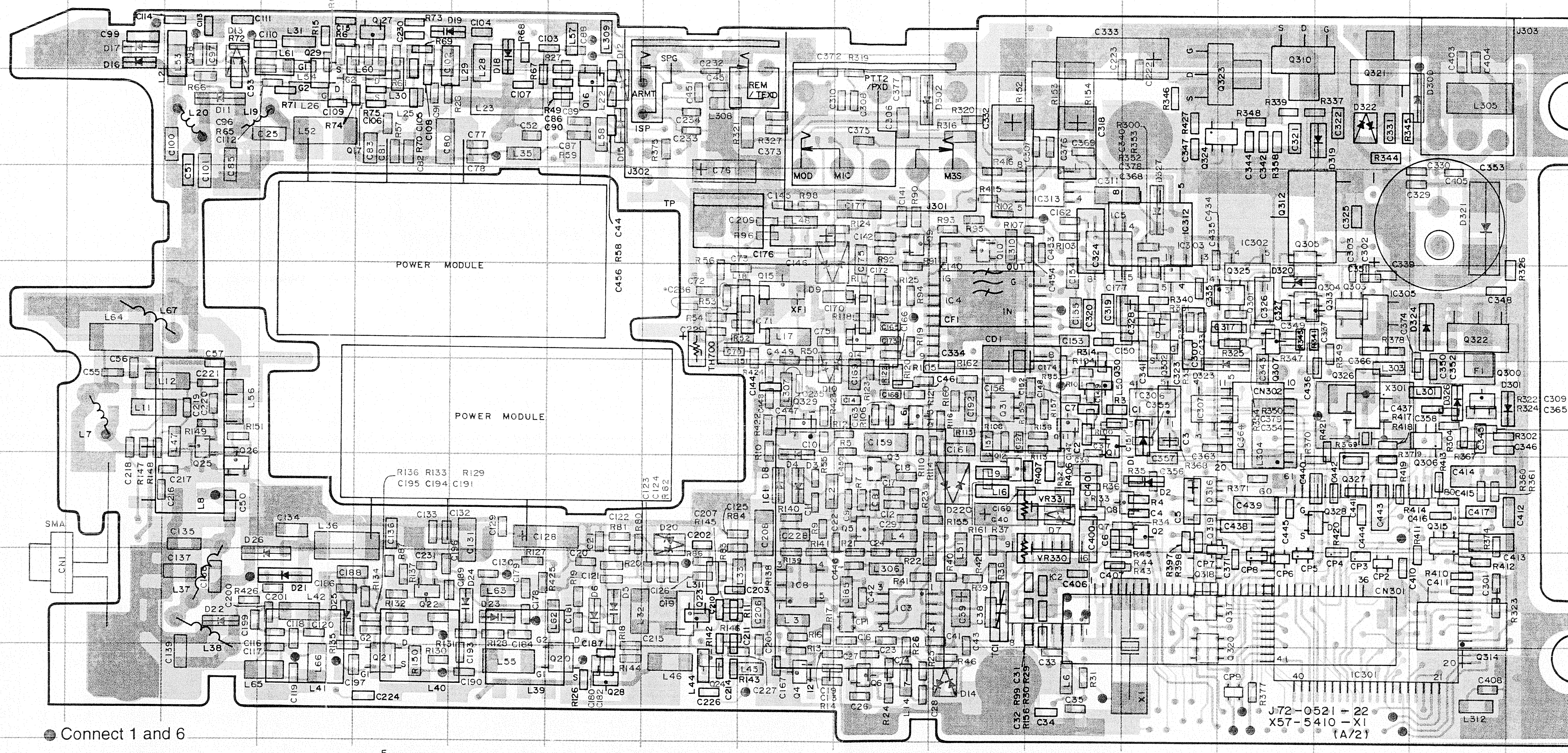
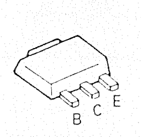

POWER MODULE
POWER MODULE
MOD
MIC
M3S
REM /TEXD
PTT2 /PXD
SPG
ARMT
ISP
TP
SMA
CN1
XF1
CF1
IC4
IC2
IC3
IC301
IC302
IC303
IC305
CN301
CN302
J301
J302
J303
L312
J72-0521-22
X57-5410-X1
(A/2)

● Connect 1 and 6

Component side
Pattern1
Pattern2
Pattern3
Pattern4
Pattern5
Pattern6
Foil side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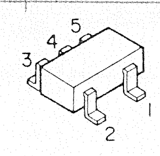
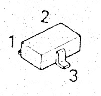
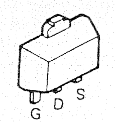

UMC4


DA221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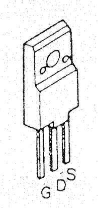
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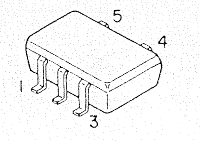
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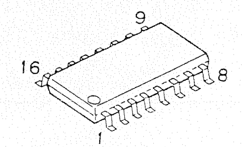
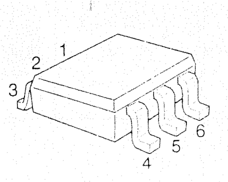
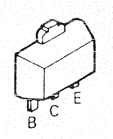

MC3372SV


UMX2N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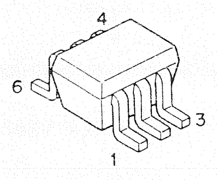
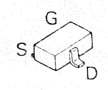
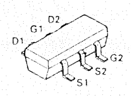

UMA10N
UMA11N


2SJ243
2SK1824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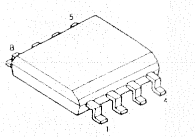
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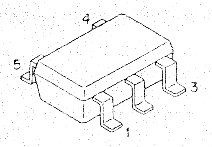
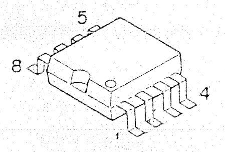
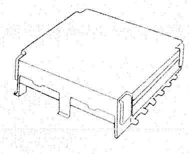
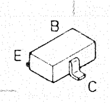

RN5VL30C
RN5VT25A


AT24C64N10SI18


KCH36


DTA114YE
DTC144EE
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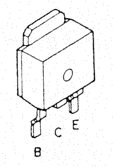
2SC3356
2SC4617
2SC4738
2SC5108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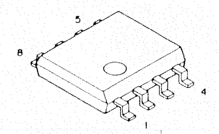
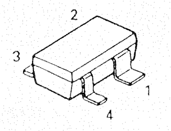

TC4W53FU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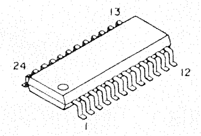
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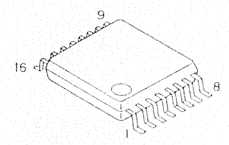
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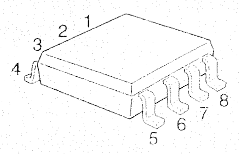

TC4W66FU

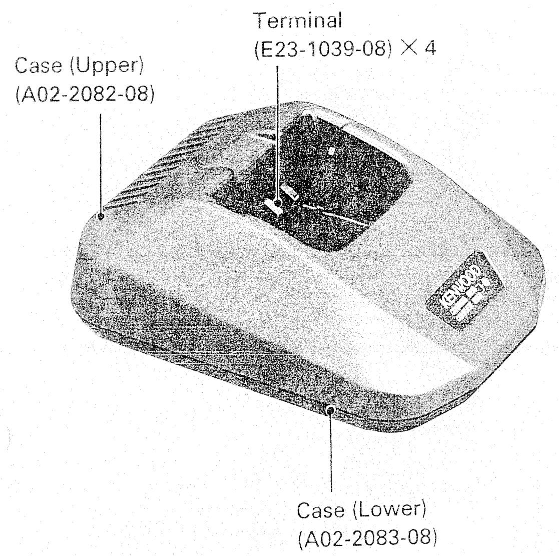
D17	2B
D18	2F
D19	2E
D20	7H
D21	8D
D22	8C
D23	8F
D24	8F
D25	8D
D26	8D
D220	7K
D300	3P
D301	6P
D302	3K
D319	3O
D320	5N
D321	4P
D322	3O
D323	6N
D324	5P
D326	6P
D327	4M

Q324	3M
Q325	5N
Q326	6O
Q327	7O
Q328	7O
Q329	6I
D1	6M
D2	7M
D3	7I
D4	7I
D5	8G
D6	8G
D7	7L
D8	7I
D9	5I
D10	6I
D11	3C
D12	3G
D13	2C
D14	9K
D15	3G
D16	2B

TX-RX UNIT (X57-5410-XX)
(A/2)(Component side) + (Foil side)

Ref.NO.	Address
IC1	7I
IC2	8L
IC3	8J
IC4	5K
IC5	4L
IC8	8I
IC100	6F
IC101	4E
IC301	9O
IC302	4N
IC303	5M
IC305	5O
IC306	6M
IC307	6M
IC312	4M
IC313	4L
Q1	6L
Q2	7M
Q3	7J
Q4	9I
Q5	7J
Q6	9J
Q7	7L
Q8	7M
Q9	4J
Q10	4K
Q11	6L
Q12	7K
Q13	6J
Q14	5J
Q15	5I
Q16	3G
Q17	3E
Q19	8H
Q20	9G
Q21	9E
Q22	8E
Q23	8H
Q24	9H
Q25	6C
Q26	7C
Q27	2E
Q28	9G
Q29	2D
Q30	6L
Q31	6K
Q300	6P
Q301	5N
Q302	5M
Q303	5O
Q304	5N
Q305	4N
Q306	6P
Q307	6N
Q310	2N
Q312	4N
Q313	5N
Q314	8P
Q315	7P
Q316	7N
Q317	8M
Q318	8M
Q319	7M
Q320	9M
Q321	2O
Q322	5P
Q323	3M

BC-19 RAPID CHARGER



Specifications

Charging current .... 700mA±70mA (PB-38), 450mA±45mA (PB-39)
Charging time (Minute) ..... 60±30% (PB-38), 90±30% (PB-39)
Source voltage .... 15V±10% or more
Terminal voltage (Open) ... 17.3V±0.8V
Ambient temperature .... 5°C~40°C
Dimensions .... 105 (W)×135 (D)×55 (H) (mm)
Weight 0.16kg

1. Power supply section

1) The power supply generates constant current (700mA or 450mA)from the input voltage (rated 15V DC)from the adapter.
2) IC3 is a DC/DC converter.
3) R26 is a resistor for current detection.
4) R24, R52 and R25 are resistors for no-load voltage detection.
5) IC2 is a power supply IC for the microcomputer (IC1).

2. Charging control section

1) The microcomputer (IC1) controls following.
   - Peak detection
   - Temperature control
   - Detection of abnormality,such as a short terminal
   - LED control
   - Trickle charging
   - Timer control
2) IC4 resets the microcomputer.
3) X1 is an oscillator that generates clocks for the microcomputer.

3. Charging switch section

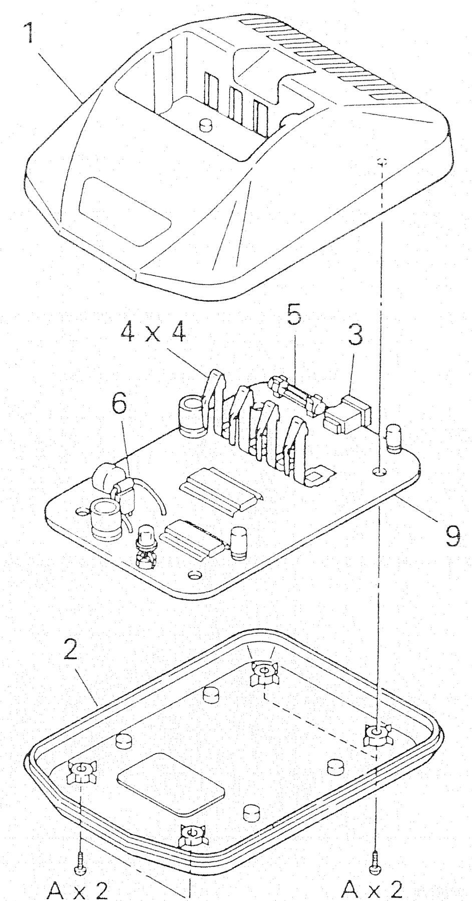
1) Q1 is a transistor that turns quick charging on and off.
2) Q2 is a transistor that turns trickle charging on and off.
3) The resistor (R6) determines the trickle current.

4. Display section

1) LED1 is a two-color LED that indicates the charging state.
2) Red ON .... Quick charging
   Green ON .... Charging is complete
   Red Blinking .... Abnormal (short terminal,short battery,or open T terminal)

BC-19 RAPID CHARGER

Exploded view



Parts List

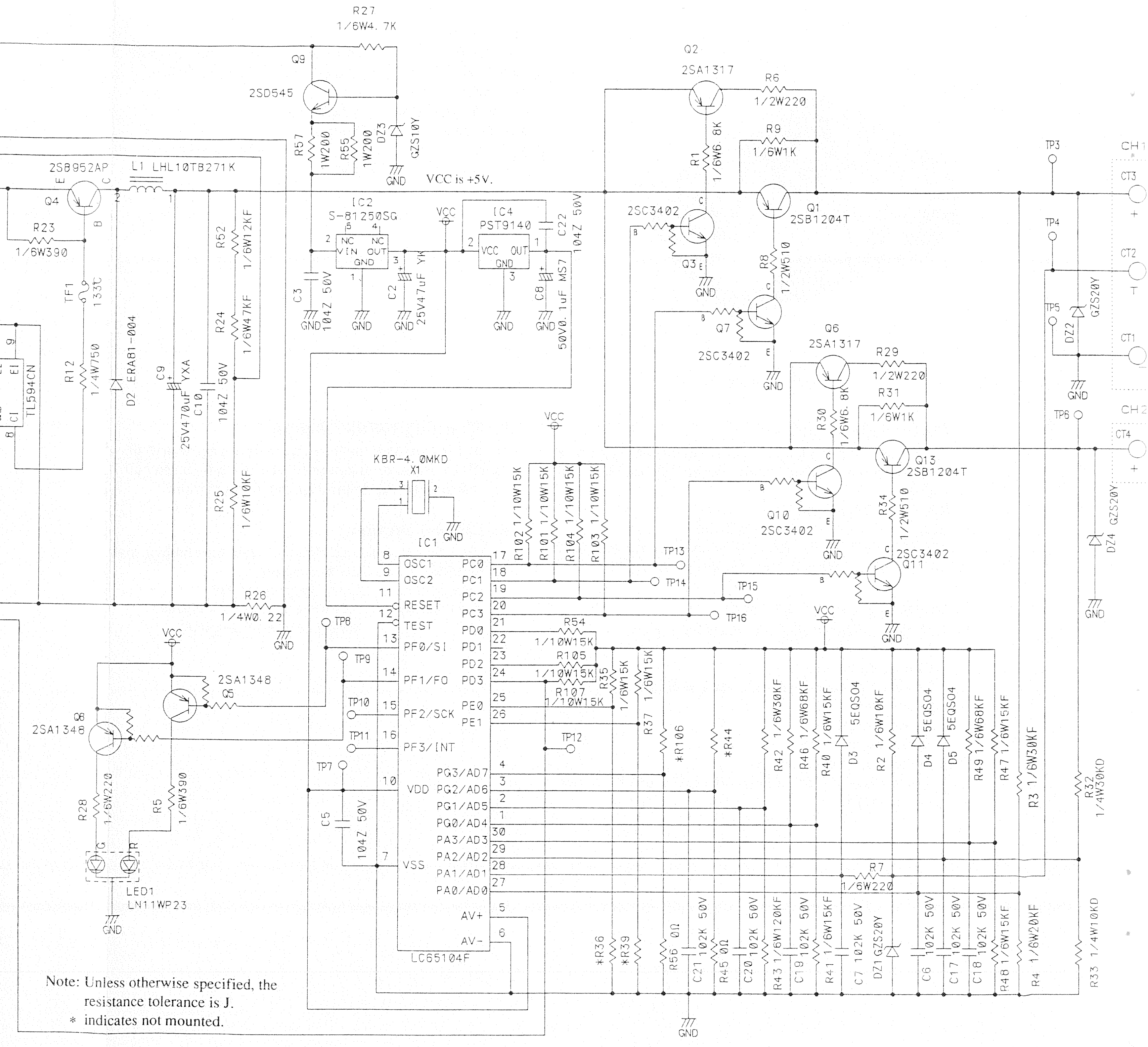
* New parts

	Ref.No.	New parts	Parts No.	Description	Desti-nation
	1	*	A02-2082-08	Case (Upper)	
	2	*	A02-2083-08	Case (Lower)	
	3		E03-0187-08	Jack	
	4		E23-1039-08	Terminal	
△	5	*	F53-0149-08	Fuse (2A)	
△	6	*	F09-0460-08	Thermal fuse	
	A		N80-2610-45	Pan head tapping screw	
△	9	*	W02-1928-08	Circrit module	
△			W08-0477-05	AC adapter (120V/60Hz)	K
△			W08-0478-05	AC adapter (230V/50Hz)	E

△ indicates safety critical components

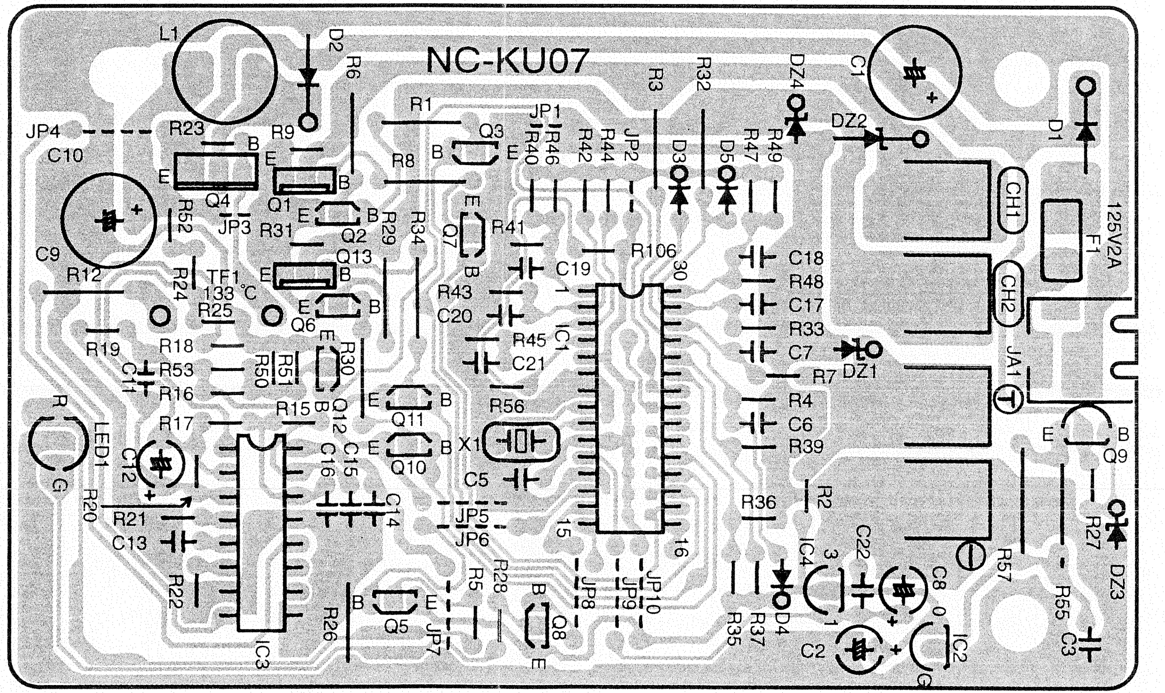
BC-19 RAPID CHARGER

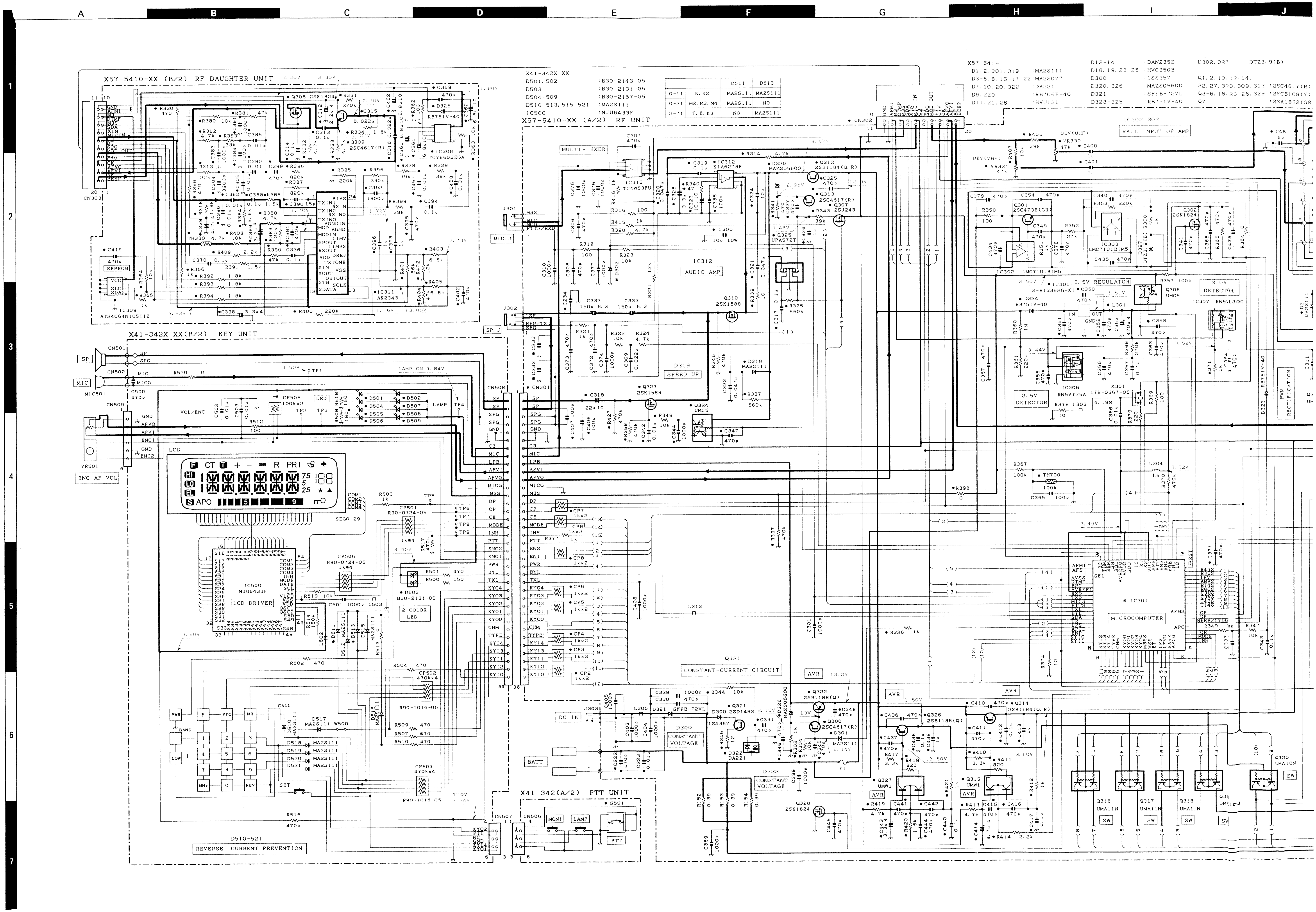
■ CIRCUIT DIAGRAM (W02-1928-08)


JA1
INPUT DC 11V
TP1
TP2
F1 TE5-T 125V2A
D1 ERA81-004
C1 25V470u YK
Q4 2SB952AP
L1 LHL10TB271K
R23 1/6W390
TF1 133℃
R12 1/4W750
D2 ERA81-004
C9 25V470uF YXA
C10 104Z 50V
R52 1/6W12KF
R24 1/6W47KF
R25 1/6W10KF
R26 1/4W0.22
C14 104Z 50V
C16 103Z 50V
C15 103Z 50V
R15 1/6W12KF
R17 1/6W2.2KF
IC3 TL594CN
C13 471K50V
R20 1/6W100K
R21 1/6W470
R22 1/6W51K
C12 50V0.47uF YK
R19 1/6W100K
C11 R104K 50V
R18 1/6W2.2KF
R16 1/6W510F
R53 1/6W510F
R51
R50 1/6W150F
Q12 2SC3402
Q9 2SD545
R27 1/6W4.7K
R57 1W200
R55 1W200
DZ3 GZS10Y
VCC is +5V.
IC2 S-81250SG
C3 104Z 50V
C2 25V47uF YK
IC4 PST9140
C22 104Z 50V
C8 50V0.1uF MS7
Q2 2SA1317
R6 1/2W220
R9 1/6W1K
R1 1/6W6.8K
Q1 2SB1204T
Q3 2SC3402
R8 1/2W510
Q7 2SC3402
Q6 2SA1317
R29 1/2W220
R31 1/6W1K
R30 1/6W6.8K
Q13 2SB1204T
Q10 2SC3402
R34 1/2W510
Q11 2SC3402
TP3
TP4
TP5
TP6
DZ2 GZS20Y
DZ4 GZS20Y
CH1
CH2
CT1
CT2
CT3
CT4
X1 KBR-4.0MKD
IC1 LC65104F
OSC1
OSC2
RESET
TEST
PF0/SI
PF1/FO
PF2/SCK
PF3/INT
VDD
VSS
PC0
PC1
PC2
PC3
PD0
PD1
PD2
PD3
PE0
PE1
PG3/AD7
PG2/AD6
PG1/AD5
PG0/AD4
PA3/AD3
PA2/AD2
PA1/AD1
PA0/AD0
AV+
AV-
R102 1/10W15K
R101 1/10W15K
R104 1/10W15K
R103 1/10W15K
R54 1/10W15K
R105 1/10W15K
R107 1/10W15K
R35 1/6W15K
R37 1/6W15K
*R106
*R44
R42 1/6W30KF
R46 1/6W68KF
R40 1/6W15KF
D3 5EQS04
R2 1/6W10KF
D4 5EQS04
D5 5EQS04
R49 1/6W68KF
R47 1/6W15KF
R3 1/6W30KF
R32 1/4W30KD
R7 1/6W220
R33 1/4W10KD
*R36
*R39
R56 0Ω
C21 102K 50V
R45 0Ω
C20 102K 50V
R43 1/6W120KF
C19 102K 50V
R41 1/6W15KF
C7 102K 50V
DZ1 GZS20Y
C6 102K 50V
C17 102K 50V
C18 102K 50V
R48 1/6W15KF
R4 1/6W20KF
C5 104Z 50V
Q5 2SA1348
Q8 2SA1348
R28 1/6W220
R5 1/6W390
LED1 LN11WP23
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
VCC
GND

Note: Unless otherwise specified, the resistance tolerance is J.
* indicates not mounted.

■ PC BOARD VIEW (W02-1928-08) Component side view


NC-KU07
L1
D2
R6
C1
D1
JP4
C10
R23
R9
Q4
Q1
Q2
JP3
R31
R52
C9
R12
TF1 133℃
R24
R25
Q6
Q13
R29
R34
Q7
R30
R19
R18
R53
R16
C11
R17
R50
R51
R15
Q12
LED1
C12
R20
R21
C13
R22
IC3
R26
R1
R8
Q3
JP1
R40
R46
R42
R44
JP2
R3
R32
D3
D5
R47
R49
DZ4
DZ2
R41
C19
R106
R43
C20
R45
C21
R56
IC1
Q11
Q10
X1
C5
C14
C15
C16
JP5
JP6
R5
R28
Q5
JP7
JP8
JP9
JP10
Q8
C18
R48
C17
R33
C7
R7
DZ1
R4
C6
R39
R36
R2
IC4
D4
R37
R35
C22
C2
C8
IC2
R57
CH1
CH2
JA1
F1
125V2A
Q9
R27
DZ3
R55
C3


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
X57-5410-XX (B/2) RF DAUGHTER UNIT
CN303
EEPROM
IC309
AT24C64N10S118
IC311
AK2343
IC308
TC7660SE0A
X41-342X-XX(B/2) KEY UNIT
SP
MIC
MIC501
VR501
ENC AF VOL
LCD
LED
LAMP
2-COLOR LED
LCD DRIVER
IC500
NJU6433F
D503
B30-2131-05
CP501
R90-0724-05
CP506
R90-0724-05
CP502
CP503
R90-1016-05
D510-521
REVERSE CURRENT PREVENTION
X41-342(A/2) PTT UNIT
MONI
LAMP
PTT
CN506
CN507
CN508
X57-5410-XX (A/2) RF UNIT
MULTIPLEXER
IC313
TC4W53FU
IC312
KIA6278F
AUDIO AMP
MIC.J
SP.J
J301
J302
CN301
CN302
D319
SPEED UP
Q321
CONSTANT-CURRENT CIRCUIT
DC IN
J303
BATT.
D300
CONSTANT VOLTAGE
D322
CONSTANT VOLTAGE
AVR
IC302, 303
RAIL INPUT OP AMP
IC305
S-81335HG-KI
3.5V REGULATOR
IC307
RN5VL30C
3.0V DETECTOR
IC306
RN5VT25A
2.5V DETECTOR
X301
L78-0367-05
IC301
MICROCOMPUTER
PWM RECTIFICATION
DEV(UHF)
DEV(VHF)
Q316 UMA11N
Q317 UMA11N
Q318 UMA11N
Q320 UMA10N
SW

X41-342X-XX
D501, 502 :B30-2143-05
D503 :B30-2131-05
D504-509 :B30-2157-05
D510-513, 515-521 :MA2S111
IC500 :NJU6433F

		D511	D513
0-11	K, K2	MA2S111	MA2S111
0-21	M2, M3, M4	MA2S111	NO
2-71	T, E, E3	NO	MA2S111

X57-541-
D1, 2, 301, 319 :MA2S111
D3-6, 8, 15-17, 22 :MA2S077
D7, 10, 20, 322 :DA221
D9, 220 :RB706F-40
D11, 21, 26 :HVU131
D12-14 :DAN235E
D18, 19, 23-25 :HVC350B
D300 :1SS357
D320, 326 :MAZS05600
D321 :SFPB-72VL
D323-325 :RB751V-40
D302, 327 :DTZ3.9(B)
Q1, 2, 10, 12-14, 22, 27, 300, 309, 313 :2SC4617(R)
Q3-6, 16, 23-26, 329 :2SC5108(Y)
Q7 :2SA1832(GR

J K L M N O P Q R S

SCHEMATIC DIAGRAM TH-G71A/E

Note) • Ref.NO : Parts of pattem1.

D302, 327 :DTZ3.9(B)

Q1, 2, 10, 12-14,
22, 27, 300, 309, 313 :2SC4617(R)
Q3-6, 16, 23-26, 329 :2SC5108(Y)
Q7 :2SA1832(GR)

Q8, 301 :2SC4738(GR)
Q9, 11 :2SC4649(N, P)
Q15, 19 :2SC3356
Q17, 20, 21, 29 :3SK239A
Q28 :DTC144EE
Q30 :UMC4

Q31 :UMX2N
Q302, 308, 328 :2SK1824
Q303 :UMG1
Q304, 316-319 :UMA11N
Q305 :UPA672T
Q306 :UMC5

Q307 :2SJ243
Q310, 323 :2SK1588
Q312, 314 :2SB1184(Q, R)
Q315, 327 :UMW1
Q320 :UMA10N
Q321 :2SD1483

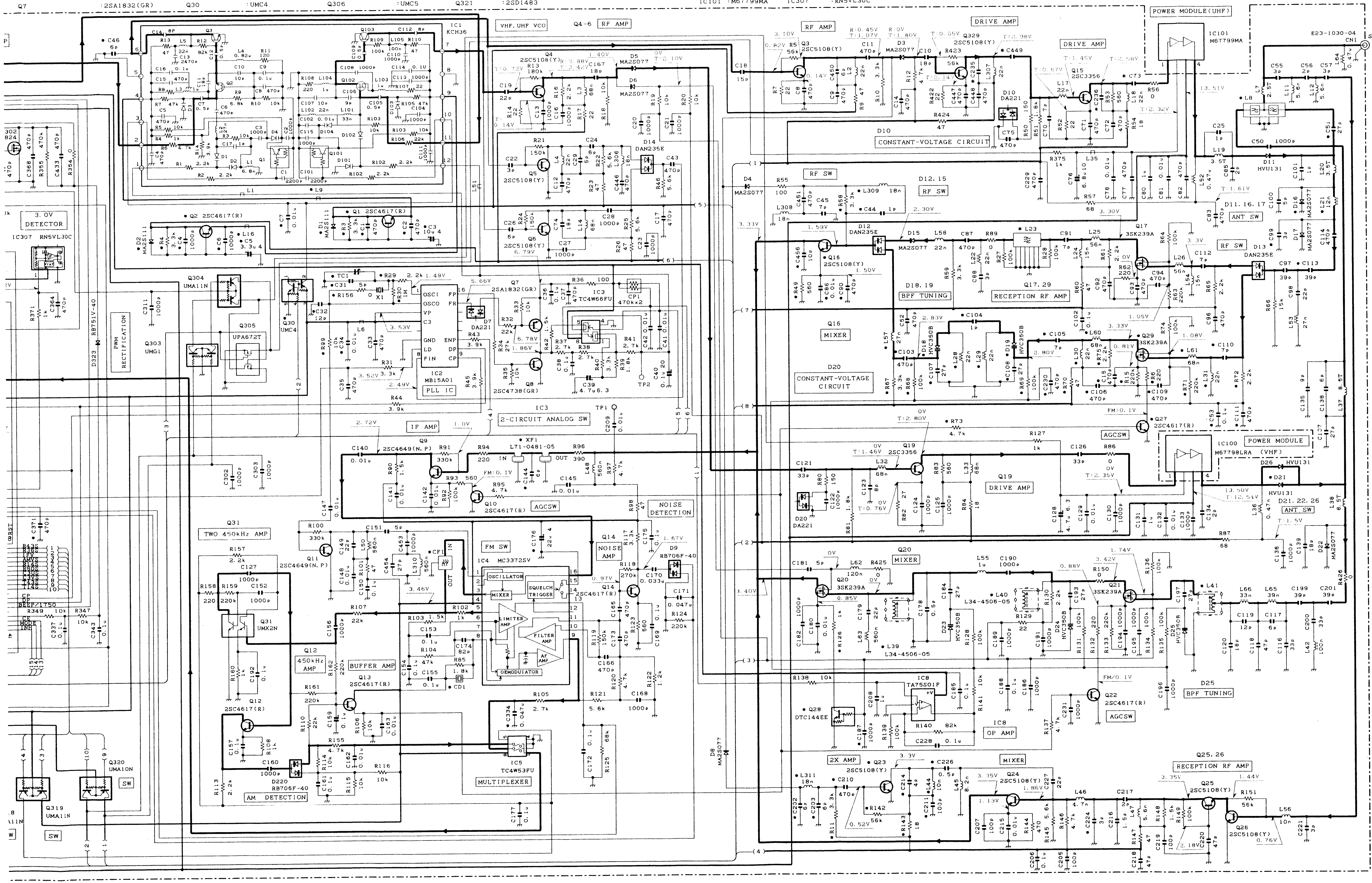
Q322, 326 :2SB1188(Q)
Q324 :UMC5
Q325 :UPA572T
IC1 :KCH36
IC2 :MB15A01

IC3 :TC4W66FU
IC4 :MC3372SV
IC5 :TC4W53FU
IC8 :TA75S01F
IC100 :M67798LRA
IC101 :M67799MA

IC301 :UPD78054GK-538(0-11)
IC301 :UPD78054GK-541(0-21)
IC302, 303 :LMC7101BIM5
IC305 :S-81335HG-KI
IC306 :RN5VT25A
IC307 :RN5VL30C

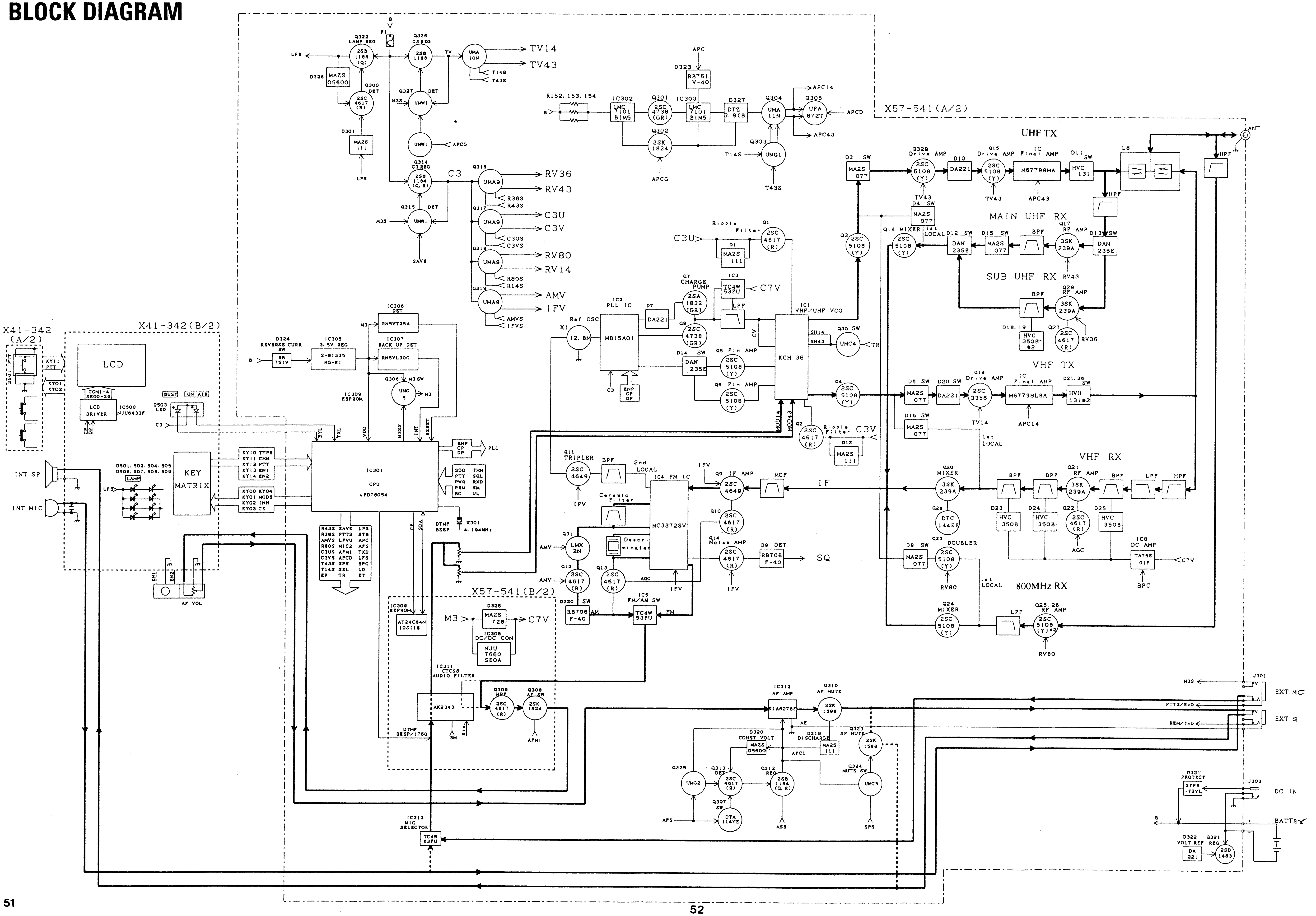
IC308 :TC7660SEOA
IC309 :AT24C64N10SI18
IC311 :AK2343
IC312 :KIA6278F
IC313 :TC4W53FU

		IC301	L23	D302	C73	C232-234	C235	C236	C449
0-11	K. K2	UPD78054GK-538	L79-1493-05	NO	15p	NO	NO	NO	5p
0-21	T. E. E3. M2. M3. M4	UPD78054GK-541	L79-1492-05	DTZ3.9(B)	470p	100p	6p	7p	NO

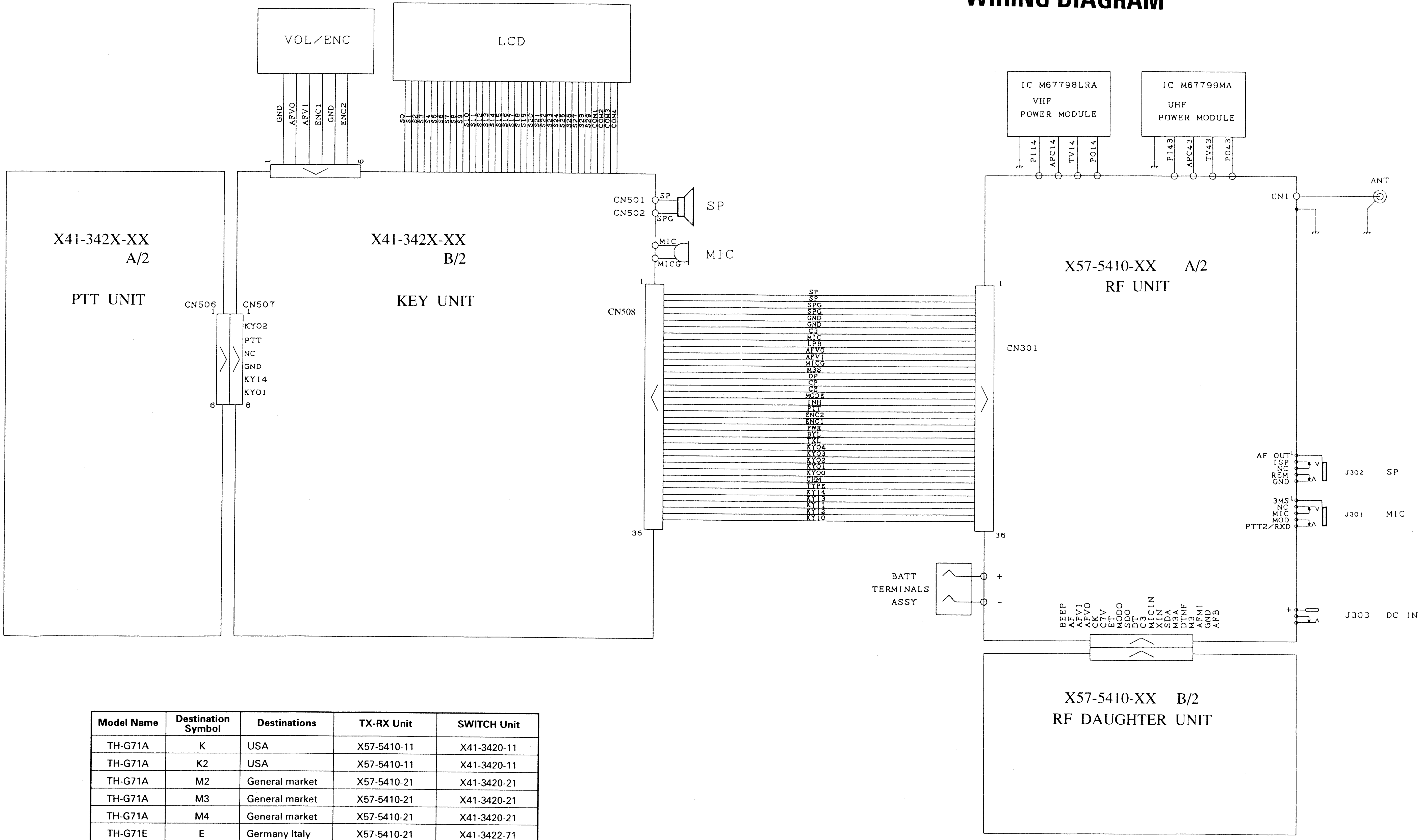

VHF, UHF VCO
IC1 KCH36
Q4-6 RF AMP
RF AMP
DRIVE AMP
DRIVE AMP
POWER MODULE (UHF)
IC101 M67799MA
E23-1030-04 CN1
SMA ANT
CONSTANT-VOLTAGE CIRCUIT
D10
3.0V DETECTOR
IC307 RN5VL30C
Q304 UMA11N
Q305 UPA672T
Q303 UMG1
PWM RECTIFICATION
Q30 UMC4
IC2 MB15A01
PLL IC
Q7 2SA1832(GR)
IC3 TC4W66FU
2-CIRCUIT ANALOG SW
IF AMP
XF1 L71-0481-05
AGCSW
NOISE DETECTION
Q31 TWO 450kHz AMP
Q31 UMX2N
IC4 MC3372SV
FM SW
NOISE AMP
OSCILLATOR
MIXER
SQUELCH TRIGGER
LIMITER AMP
FILTER AMP
AF AMP
DEMODULATOR
Q12 450kHz AMP
BUFFER AMP
AM DETECTION
IC5 TC4W53FU
MULTIPLEXER
Q320 UMA10N
Q319 UMA11N
SW
RF SW
RF SW
D12, 15
Q16 MIXER
D18, 19 BPF TUNING
Q17, 29 RECEPTION RF AMP
D20 CONSTANT-VOLTAGE CIRCUIT
ANT SW
D11, 16, 17
RF SW
D13 DAN235E
IC100 M67798LRA
POWER MODULE (VHF)
Q19 DRIVE AMP
AGCSW
ANT SW
D21, 22, 26
Q20 MIXER
D25 BPF TUNING
AGCSW
IC8 TA75S01F
OP AMP
2X AMP
MIXER
Q25, 26 RECEPTION RF AMP

TH-G71A/E TH-G71A/E

BLOCK DIAGRAM

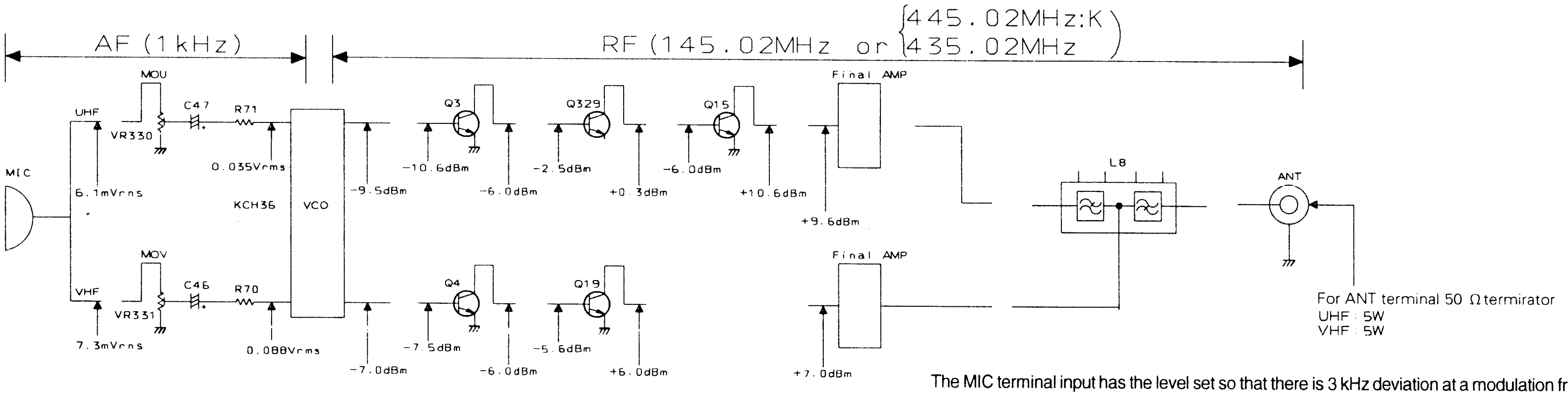

X57-541(A/2)
X41-342 (A/2)
X41-342(B/2)
X57-541(B/2)
UHF TX
MAIN UHF RX
SUB UHF RX
VHF TX
VHF RX
800MHz RX
LCD
KEY MATRIX
IC301 CPU μPD78054
IC1 VHF/UHF VCO KCH 36
IC2 PLL IC MB15A01
IC4 FM IC MC3372SV
IC312 AF AMP
IC313 MIC SELECTOR
IC311 CTCSS AUDIO FILTER AK2343
IC308 DC/DC CON NJU 7660
IC309 EEPROM AT24C64N
IC305 3.5V REG S-81335
M67799MA
M67798LRA
Q322 LAMP REG
Q326 C3 REG
Q314 C3 REG
Q20 MIXER
Q24 MIXER
Q11 TRIPLER
Q9 IF AMP
Q14 Noise AMP
Q310 AF MUTE
Q323 SP MUTE
Q321 REF REG
D321 PROTECT
L8
HPF
LPF
BPF
MCF
IF
SQ
ANT
TV14
TV43
RV36
RV43
C3U
C3V
RV80
RV14
AMV
IFV
APC
C7V
J301
EXT MIC
EXT SP
J303
DC IN
BATTERY
INT SP
INT MIC
AF VOL
X1 12.8M
X301 4.194MHz
BUSY
ON AIR
LAMP

WIRING DIAGRAM


VOL/ENC
GND
AFVO
AFVI
ENC1
GND
ENC2
1
6
LCD
S0 S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 COM1 COM2 COM3 COM4
X41-342X-XX
A/2
PTT UNIT
CN506
1
6
CN507
1
KYO2
PTT
NC
GND
KY14
KYO1
6
X41-342X-XX
B/2
KEY UNIT
CN501
CN502
SP
SPG
SP
MIC
MICG
MIC
1
CN508
36
SP
SP
SPG
SPG
GND
GND
C3
MIC
LPB
AFVO
AFVI
MICG
M3S
DP
CP
CE
MODE
INH
PTT
ENC2
ENC1
PWR
BYL
TXL
KYO4
KYO3
KYO2
KYO1
KYO0
CHM
TYPE
KY14
KY13
KY11
KY12
KY10
1
CN301
36
IC M67798LRA
VHF
POWER MODULE
PI14
APC14
TV14
PO14
IC M67799MA
UHF
POWER MODULE
PI43
APC43
TV43
PO43
ANT
CN1
X57-5410-XX A/2
RF UNIT
AF OUT
ISP
NC
REM
GND
J302
SP
3MS
NC
MIC
MOD
PTT2/RXD
J301
MIC
BATT
TERMINALS
ASSY
+
-
BEEP
AF
AFVI
AFVO
CK
C7V
ET
MODO
SDO
DT
C3
MICIN
XIN
SDA
M3A
DTMF
M3
AFMI
GND
AFB
+
J303
DC IN
X57-5410-XX B/2
RF DAUGHTER UNIT

Model Name	Destination Symbol	Destinations	TX-RX Unit	SWITCH Unit
TH-G71A	K	USA	X57-5410-11	X41-3420-11
TH-G71A	K2	USA	X57-5410-11	X41-3420-11
TH-G71A	M2	General market	X57-5410-21	X41-3420-21
TH-G71A	M3	General market	X57-5410-21	X41-3420-21
TH-G71A	M4	General market	X57-5410-21	X41-3420-21
TH-G71E	E	Germany Italy	X57-5410-21	X41-3422-71
TH-G71E	E3	Belgium Holland Spain France	X57-5410-21	X41-3422-71
TH-G71E	T	England	X57-5410-21	X41-3422-71

TX Section


AF (1kHz)
RF (145.02MHz or {445.02MHz:K / 435.02MHz)
MIC
UHF
VHF
MOU
MOV
VR330
VR331
C47
C46
R71
R70
6.1mVrns
7.3mVrns
0.035Vrms
0.088Vrms
KCH36
VCO
-9.5dBm
-7.0dBm
Q3
Q4
-10.6dBm
-6.0dBm
-7.5dBm
-6.0dBm
Q329
Q19
-2.5dBm
+0.3dBm
-5.6dBm
+6.0dBm
Q15
-6.0dBm
+10.6dBm
Final AMP
+9.6dBm
Final AMP
+7.0dBm
L8
ANT
For ANT terminal 50 Ω termirator
UHF : 5W
VHF : 5W

The MIC terminal input has the level set so that there is 3 kHz deviation at a modulation frequency of 1 kHz.

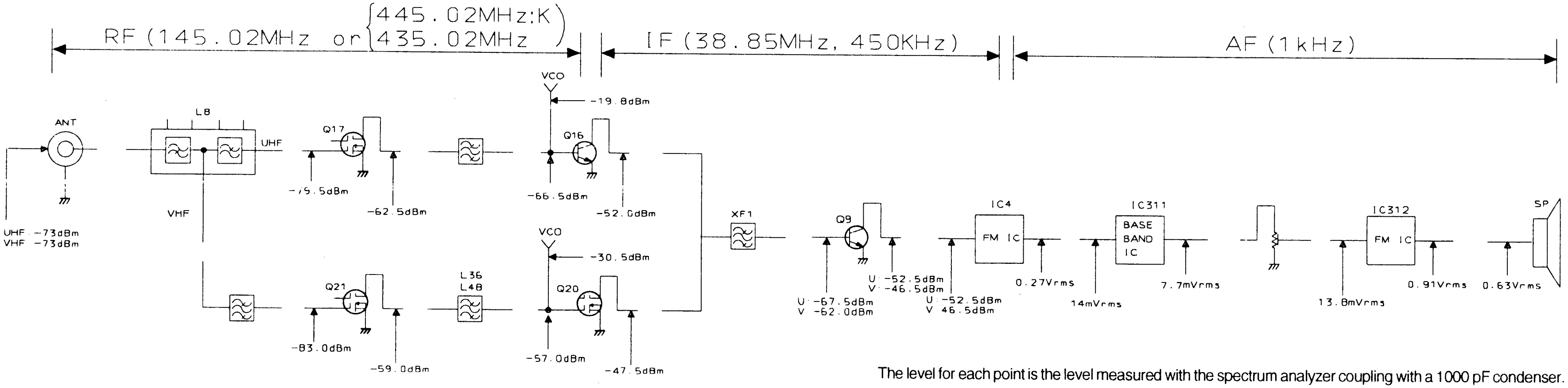
The level for each point is the level measured with the spectrum analyzer coupling with a 1000 pF condenser.

AF is the level measured directly with the AF VTVM.

The level for each point is the level measured without cutting the pattern or removing parts.

The level for each transistor is the level when the terminals are measured directly with a 1000 pF condenser.

RX Section


RF (145.02MHz or {445.02MHz:K / 435.02MHz)
IF (38.85MHz, 450KHz)
AF (1kHz)
ANT
UHF -73dBm
VHF -73dBm
L8
UHF
VHF
Q17
-75.5dBm
-62.5dBm
Q21
-83.0dBm
-59.0dBm
L36
L48
VCO
-19.8dBm
Q16
-66.5dBm
-52.0dBm
VCO
-30.5dBm
Q20
-57.0dBm
-47.5dBm
XF1
Q9
U -67.5dBm
V -62.0dBm
U -52.5dBm
V -46.5dBm
IC4
FM IC
U -52.5dBm
V 46.5dBm
0.27Vrms
IC311
BASE BAND IC
14mVrms
7.7mVrms
IC312
FM IC
13.8mVrms
0.91Vrms
SP
0.63Vrms

The level for each point is the level measured with the spectrum analyzer coupling with a 1000 pF condenser.

AF is the level measured directly with the AF VTVM.

The AF level is the level when the AF output is adjusted to 0.63 VRMS with AF VOL (S1).

The level for each point is the level measured without cutting the pattern or removing parts.

The level for each transistor is the level when the terminals are measured directly with a 1000 pF condenser.

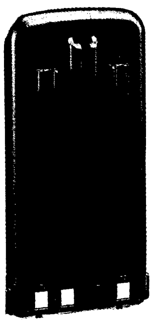
TERMINAL FUNCTION

Connector No.	Pin No.	Pin name	Function
CN301,	1	SP	Internal speaker audio
CN508	2	SP	Internal speaker audio
	3	SPG	Audio ground
	4	SPG	Audio ground
	5	GND	GND
	6	GND	GND
	7	C3	Reception power supplies, PLL, VCO power supply
	8	MIC	Internal mic
	9	LPB	Lamp power supply
	10	AFVI	Reception volume IN audio
	11	AFVO	Reception volume OUT audio
	12	MICG	Mic ground
	13	M3S	Power supply with M3 switched
	14	DP	Data
	15	CP	Clock
	16	CE	LCD driver chip enable
	17	MODE	LCD driver mode setting
	18	INH	LCD driver display off input terminal
	19	PTT	PTT
	20	ENC2	Encoder 2
	21	ENC1	Encoder 1
	22	PWR	Power switch
	23	BYL	BUSY lamp control
	24	TXL	TX lamp control
	25	KYO4	Key matrix
	26	KYO3	Key matrix
	27	KYO2	Key matrix
	28	KYO1	Key matrix
	29	KYO0	Key matrix
	30	CHM	Key lock channel display mode
	31	TYPE	Type
	32	KY14	Key matrix
	33	KY13	Key matrix
	34	KY11	Key matrix
	35	KY12	Key matrix
	36	KY10	Key matrix

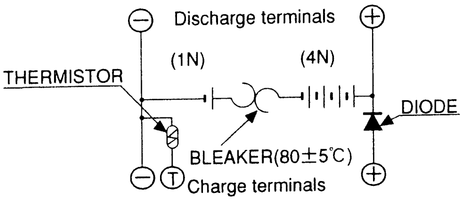
Connector No.	Pin No.	Pin name	Function
CN302,	1	BEEP	BEEP
CN303	2	AFVI	Reception volume In audio
	3	CK	Clock
	4	ET	AK2343 tone squelch enable
	5	SDO	AK2343 tone detection
	6	C3	AK2343 audio filter power supply
	7	XIN	4.194 MHz for AK2343
	8	M3S	Power supply with M3 switched
	9	M3	Microcomputer, EEPROM power supply
	10	GND	GND
	11	GND	GND
	12	AFM1	Audio mute (before volume)
	13	DTMF	DTMF
	14	SDA	EEPROM serial data
	15	MICIN	Mic input
	16	DT	AK2343 data
	17	MODOUT	Modulation output
	18	C7V	7V DC/DC comparator output
	19	AFVO	Reception volume OUT audio
	20	AF	Reception detection output

PB-38 (STANDARD BATTERY BACK) / PB-39 (HIGH POWER BATTERY BACK) / SC-45(SOFT CASE) / BT-11(BATTERY CASE)

PB-38: External view (6.0V 650mAh)



Schematic diagram

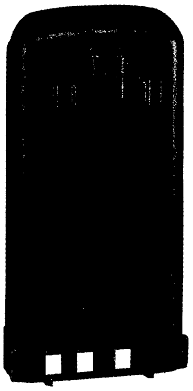

Discharge terminals
(1N)
(4N)
THERMISTOR
DIODE
BLEAKER(80±5°C)
T
Charge terminals

Main external shape dimensions and weight

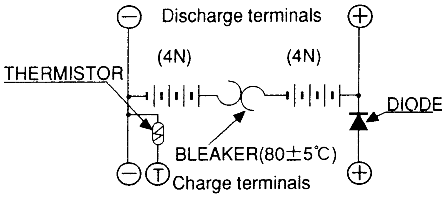
Item	Unit	Main unit	
		A	B
Width (W)	mm	54	58
Depth (D)	mm	11.8	15.9
Height (H)	mm	112	112
Weight	g	About 145	

A: Dimensions not including projections
B:Dimensions including projections

PB-39: External view (9.6V 600mAh)



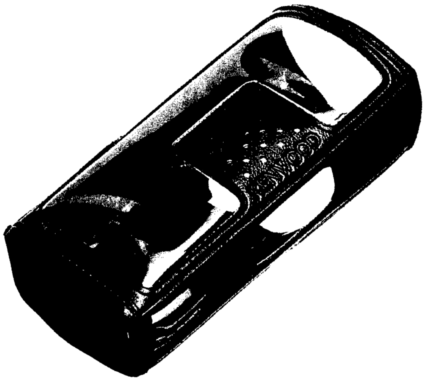
Schematic diagram


Discharge terminals
(4N)
(4N)
THERMISTOR
DIODE
BLEAKER(80±5°C)
T
Charge terminals

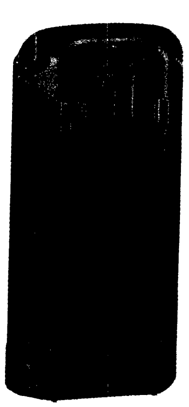
Main external shape dimensions and weight

Item	Unit	Main unit	
		A	B
Width (W)	mm	54	58
Depth (D)	mm	19.8	23.9
Height (H)	mm	112	112
Weight	g	About 183	

SC-45: External view



BT-11: External view (For 4 AA batteries)



TH-G71A/E

SPECIFICATIONS

General		VHF Band	UHF Band
Frequency range	U.S.A./Canada	144 to 148 MHz	438 to 450 MHz
	General Market	144 to 148MHz	430 to 440MHz
	Europe	144 to 146MHz	430 to 440MHz
Mode		F3E(FM)	
Usable temperature range		-20°C to+60°C (-4 °F to+140 °F)	
Rated voltage	External power supply (DC IN)	5.5to 16.0V (13.8V)	
	Battery terminals	4.5to 15.0V (6.0V)	
Current	Receive with no signals	Approx. 70mA	
	Battery Saver ON	Average 30mA	
	Transmit with HI,13.8V (DC IN)	Approx. 1.7A	Approx. 2.1A
	Transmit with HI,9.6V (battery terminals)	Approx. 1.7A	Approx. 1.8A
	Transmit with HI,6.0V (battery terminals)	Approx. 1.3A	Approx. 1.5A
	Transmit with LOW,6.0V (battery terminals)	Approx. 500mA	
	Transmit with EL,6.0V (battery terminals)	Approx. 300mA	
Ground method		Negative	
Dimensions (W × H × D,projections included) [1]		54 × 112 × 33.5mm / 2.13 × 4.41 × 1.32in	
Weight [1, 2]		Approx.330g/11.6oz	
Microphone impedance		2k Ω	
Antenna impedance		50 Ω	
Transmitter		**VHF Band**	**UHF Band**
Power output	HI,13.8V	6W	5.5W
	HI,9.6V	Approx. 5W	
	HI,6.0V	Approx. 2.5W	Approx.2.2W
	LOW,6.0V	Approx. 0.5W	
	EL,6.0V	Approx. 50mW	
Modulation		Reactance	
Maximum frequency deviation		Within ± 5kHz	
Spurious emissions		-60dB or less	
Receiver		**VHF Band**	**UHF Band**
Circuitry		Double conversion superheterodyne	
1st intermediate frequency		38.85 MHz	
2st intermediate frequency		450 kHz	
Sensitivity (12dB SINAD)		0.18 μV or less	
Squelch sensitivity		0.1 μV or less	
Selectivity (-6dB)		12kHz or more	
Selectivity (-40dB)		28kHz or less	
Audio output (10%distortion)	9.6V (battery terminals)	500mW or higher (8 Ω load)	
	6.0V (battery terminals)	300mW or higher (8 Ω load)	

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[1] With a PB-38 installed

[2] PB-38,antenna,and belt hook included

Specifications are subject to change without notice due to advancements in technology.

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